

A Roof without Walls: Benjamin Bloom's Taxonomy and the Misdirection of American Education

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Abstract Plato wrote that higher order thinking could not start until the student had mastered conventional wisdom. The American educational establishment has turned Plato on his head with the help of a dubious approach to teaching developed by one Benjamin Bloom. Bloom's taxonomy was intended for higher education, but its misappropriation has resulted in a serious distortion of the purpose of the K–12 years. Michael Booker attributes the inability of American children to compete internationally to a great extent to our reliance on Bloom in expecting critical and advanced thinking from kids who have been trained to regard facts and substantive knowledge as unimportant.

Keywords Higher order thinking · Critical thinking · K–12 · Teacher training · Pedagogy · Noncompetitive students · Content · Methodology

“Since you're college teachers, none of your course objectives should be at the first level of the Taxonomy.”

The consultant's casual statement stunned most of us. Since our community college was up for accreditation, we were trying to get our proverbial ducks in a row. We knew that assessment was a major issue for accreditation, and we'd paid an experienced consultant to provide us with assistance. Assessment, we were told, involves objectives. The objectives need to tie into measurable outcomes. Those outcomes need to be expressed in verb-first propositions about student behavior. Those behaviors need to reflect Bloom's Taxonomy. The lowest level of the Taxonomy—beneath our concern: *Knowledge*.

Something seemed horribly wrong, and so I ventured into alien territory, the world of education. The fact that I've taught 200 sections of college-level

This title for this paper was suggested by my colleague, Susan Todd, Associate Professor of English at Jefferson College. I am indebted to Professor George K. Cunningham (retired), formerly of the University of Louisville, for his assistance in understanding the larger context of the Taxonomy. I am also indebted to my wife, Anne, who located key early documents on the Taxonomy for me.

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philosophy did not prepare me for what I'd find. I have become convinced that the framework known as Bloom's Taxonomy has, in its application, done great harm to American education. In order to be as clear as possible in my assertions, I will outline my argument.

- Bloom's Taxonomy, first published in *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook I: Cognitive Domain* in 1956, has become influential to the point of dogma in American Colleges of Education.
- Because of the divergent ways that educators are trained in America, the impact of Bloom's Taxonomy has been greater in the K–12 system than in post-secondary education.
- Bloom's Taxonomy has been used to devalue basic skills education and has promoted "higher order thinking" at its expense.
- Shortchanging basic skills education has resulted in producing students who misunderstand true higher-order thinking and who are not equipped for advanced education.

Given that I am being critical of the U.S. education system,¹ it is worthwhile to review some common concerns about that system. First, according to U.S. Census Bureau data for 2005, the average public school was supported at a rate of \$8,701 per pupil.² Organisation [*sic*] for Economic Co-operation and Development data shows that despite their excellent funding, U.S. public schools achieve only mediocre results.³ The underperformance of our public schools follows an intriguing pattern. Many studies, like the National Center for Education Statistics' TIMMS (Trends in International Mathematics and Science Study),⁴ demonstrate that our outcomes for the early grades are competitive with international norms. However, American students fall progressively behind their peers as they continue through the public school system. Despite its many successes, there is every reason to believe that there are fundamental problems with American education.

There are many candidates for blame whenever one finds a problem of this scope. Predictably, groups will opportunistically exploit public ills (or perceived public ills) to push their private agendas. I will not feign impartiality in my analysis; I will be directing more critical attention to the K–12 system than to the post-secondary system of which I am a part. However, the rules that govern K–12 teacher education are creatures of colleges of education, and so post-secondary schools are certainly central to the problem. I also recognize that no one factor can explain the current state of the American educational system, and the role I am assigning Bloom's Taxonomy does not take place in a cultural and professional vacuum. I will

¹Literature supportive of Bloom's Taxonomy boasts about the international use of the Taxonomy and its translation into over twenty languages. Having never taught college courses overseas, I will confine myself to discussion of the U.S. system.

²See <http://www.census.gov/Press-Release/www/releases/archives/education/010125.html>.

³"OECD in Figures 2007," http://oberon.sourceoecd.org/v1=6449412/cl=22/nw=1/rpsv/figures_2007/en/page24.htm.

⁴"TIMMS 2003 Results," <http://nces.ed.gov/timss/results03.asp>.

demonstrate how the Taxonomy was co-opted to serve ends for which it was not originally intended.

Dr. Benjamin S. Bloom, editor of *Taxonomy of Educational Objectives*, worked and taught at the University of Chicago for the bulk of his five-decade career. In 1940 he came to work with the Board of Examiners, an arm of the University created in 1931 and designed to remove the burden of evaluation from professors.⁵ “Under President Robert Hutchins’s General Education Plan, the undergraduate division of the University of Chicago was organized around interdisciplinary core courses and comprehensive examinations.”⁶ It is worth noting that these examinations were seen as retrospective assessments of learning rather than as integral learning tools in the educational process itself.

The Taxonomy was a collective product of thirty-four educators, psychologists, and school examiners who met from 1949 to 1953, beginning with informal discussions at an American Psychological Association conference in 1948 in Boston. Their intent was to provide an overarching classification system for test questions—questions that would fit into a larger project of educational goals and measurements.⁷

It is often forgotten that Bloom’s Taxonomy was intended to be only one part of a three-part system. The three domains which Bloom and his panel wished to classify were cognitive, affective, and psychomotor. His committee never published a guide for the psychomotor domain, though other authors have attempted such taxonomies. A guide was written and published for the affective domain in 1964 as *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook II: Affective Domain*.⁸ In this work, Bloom’s committee addressed the attitudes that a teacher may wish to instill in his or her students. I frankly find this work to be a more intriguing document than the more famous *Handbook I: Cognitive Domain*, though its impact appears to have been minimal. Much of the criticism I encounter about American education, especially in American post-secondary education, reflects concern about precisely that issue.

Returning to the more familiar *Handbook 1*, Bloom’s (cognitive) Taxonomy is a six-tiered approach to the intellectual expectations of the college classroom. It is worth reiterating the point that the Taxonomy was initially intended as a tool for college educators.⁹ As we shall later see, it has been only tangentially significant in

⁵Anderson, Lorin W., “Benjamin S. Bloom: His Life, His Works, His Legacy,” in Zimmerman, Barry J. and Schunk, Dale H. (eds), *Educational Psychology: A Century of Contributions* (Mahwah, NJ: Lawrence Erlbaum Associates, Inc., 2003), p. 369.

⁶Bloom, Benjamin S., “Reflections on the Development and Use of Taxonomy,” in Anderson, Lorin W. and Sosniak, Lauren A. (eds), *Bloom’s Taxonomy: A Forty Year Retrospective* (Chicago: The National Society for the Study of Education, 1994), pp. 1–2.

⁷Bloom, Benjamin S. (ed), *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook 1: Cognitive Domain* (New York: David McKay Company, Inc., 1956), pp. 4–5.

⁸A review of social science citations for a twenty-year period (1966–1985) shows that citations for *Handbook 1* outnumber those for *Handbook 2* by a factor of nearly 25 (1,162 versus 47).

⁹On p. 12 of *Handbook 1*, a single sentence mentions the applicability of the Taxonomy to K–12 education. This does not take away from the overall emphasis of the *Handbook*.

that environment. As originally conceived, the Taxonomy organizes intellectual behaviors as follows:¹⁰

- 1.00 Knowledge
- 2.00 Comprehension
- 3.00 Application
- 4.00 Analysis
- 5.00 Synthesis
- 6.00 Evaluation

(Readers who find the phrase “Bloom’s Taxonomy” unfamiliar may nonetheless recognize this list.)

Bloom’s committee advocated an approach to assessment that yoked explicit classroom outcomes to clear and demonstrable behaviors which could be tested. The lowest levels of the Taxonomy, particularly “Knowledge,” were seen as setting the stage for higher levels of learning. Each level then builds on the previous levels, and is dependent on them. The hierarchical nature of the Taxonomy has been subject to a variety of critiques, and there have been many attempts to refine and revise this list in the past five decades.¹¹

Soon after it was published, a body of research began to build around the Taxonomy. In 1970, Cox and Wildemann collected an index of the existing research into Bloom’s Taxonomy.¹² According to their study, 118 research projects of various sorts had been conducted in the previous decade and a half. A review of their data, however, shows that most of the research lacked experimental results that might either confirm or invalidate it. The results noted are not reassuring. Initial studies showed that individuals skilled in the Taxonomy frequently could not agree on the classification of test items or objectives.¹³ The most thorough research into the Taxonomy cited by Cox and Wildemann, a three-year project in Florida completed in 1966, offered the following conclusions:

The results of these early studies of the classification of items and the structure of the taxonomy weakly supported the validity of the taxonomy.

¹⁰Bloom, p.18. The explanation for each level is:

- 1.00 Knowledge—the ability to recall specific facts, key terms, and basic principles
- 2.00 Comprehension—the ability to state ideas in one’s own terms, and to interpret and extrapolate from a set of data
- 3.00 Application—the ability to apply principles in novel situations
- 4.00 Analysis—the ability to identify assumptions, spot logical errors and to distinguish facts from values
- 5.00 Synthesis—the ability to combine extant elements into new forms and patterns, i.e., creativity
- 6.00 Evaluation—the ability to judge by internal and external criteria

¹¹As one example, see Anderson, Lorin W., et al. (eds), *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy* (New York: Addison Wesley, 2001). In addition to offering its own revised taxonomy, chapter 15 lists nineteen alternative frameworks proposed by other authors.

¹²Cox, Richard C. and Wildemann, Carol P. *Taxonomy of Educational Objectives: Cognitive Domain. An Annotated Bibliography* (Washington, DC: U.S. Office of Education, 1970).

¹³A success rate of 64 to 84 percent is noted in Baughman, Gerald D. and Mayrhofer, Albert, “Leadership Training Project: A Final Report,” *Journal of Secondary Education*, 40 (1965), pp. 369–372.

To construct such tests was regarded as a task which would prove to be more time consuming than complex....The task had been misjudged; it was time consuming *and complex*. [emphasis in the original]

The staff had specific misgivings about the tests and the data which came from them. The test content was entirely chemistry and physics; every attempt to build a test on social science content was abortive. There was pronounced lack of confidence in all items which were prepared for Synthesis and Evaluation, and there was a lesser, but significant feeling, that items for those levels could not be written in the multiple-choice format.¹⁴

Despite the underwhelming data supporting it, Bloom's Taxonomy has been embraced far and wide. Kreitzer and Madaus noted in 1994, "It receives treatment in virtually every textbook in general education and in measurement for prospective teachers. It has even been the subject of examination questions on teacher competency tests. In short, it has become a part of the lore of educators."¹⁵ It is one of a handful of key educational concepts required for the Praxis examinations used to test the professional competence of public school teachers.¹⁶

This success, however, has not been in the arena for which the Taxonomy was initially intended. Late in his career, Benjamin Bloom wrote, "Unexpectedly, it has been used by curriculum planners, administrators, researchers, and classroom teachers at all levels of education."¹⁷ More precisely, it has had only indirect significance in post-secondary education (its intended milieu) and a great deal of impact in the K–12 system. Bloom's weighty *Handbook on Formative and Summative Evaluation of Student Learning*, published in 1971, has two chapters on preschool evaluation and none explicitly devoted to college-level assessment.

Anyone familiar with the divergent educational pathways of U.S. college and K–12 instructors ought not be surprised at this. College instructors in all but the most technical fields cannot find employment without advanced degrees in their fields. Those advanced degrees come from graduate programs which, for the most part, have no interest in what transpires in the colleges of education on their campuses.

K–12 educators, on the other hand, are licensed by state bodies which require extensive classroom time in the colleges of education.¹⁸ Even under the requirements of No Child Left Behind (NCLB) for "Highly Qualified Teachers," specific academic training in specialty fields is optional so long as one can pass a standardized test in that area.¹⁹ This is a manifestation of an underlying belief

¹⁴Kropp, Russell P. and Stoker, Howard W., "The Construction and Validation of Tests of the Cognitive Processes as Described in the 'Taxonomy of Educational Objectives'," (Florida State University, 1966), available as ERIC document ED010044.

¹⁵Kreitzer, Amelia E and Madaus, George F., "Empirical Investigations of the Hierarchical Structure of the Taxonomy," in Anderson and Sosniak, p. 64.

¹⁶*Praxis Study Guide for Principles of Learning and Teaching*, 2nd ed. (Educational Testing Service, 2004).

¹⁷Bloom in Anderson and Sosniak, p. 1.

¹⁸All states have alternative certification routes, but these still require study within approved colleges of education. See <http://www.teach-now.org> for state-by-state information.

¹⁹See <http://www.ed.gov/nclb/methods/teachers/edpicks.jhtml?src=ln>.

about the nature of thinking skills that says that education can be methodology-rich and yet content-free or content-light. Bloom's Taxonomy fuels the belief that higher order thinking can exist in isolation from specific content. Currently, it is not uncommon for high school teachers to be teaching fields for which they themselves lack serious training. For example, in the 1999–2000 academic year, 39.2 percent of U.S. high school biology teachers had neither an undergraduate major nor minor in biology. Among high school history teachers, the figure was 55.1 percent.²⁰ A high school English teacher can teach English and be considered "Highly Qualified" by merely taking a subject area test, but is not allowed to simply test out of the curriculum found in the college of education.

The net effect of these diverging pathways is that Bloom's Taxonomy is a framework that K–12 instructors encounter early and often, while post-secondary instructors often have no direct exposure to it. The absence of direct exposure does not, however, make it irrelevant to college instructors. It is a key tool in standardized testing and in textbook development, and so it pervades the tools that college teachers use. The tepid questions found at the end of the chapters of college textbooks, for example, reflect the Taxonomy, as do the frequent admonitions to engage in "critical thinking" (e.g., Was Socrates really a great philosopher? Discuss with your peers who know no more about him than you do). College instructors who pursue graduate training in education will certainly encounter it, and those who become involved in their college's accreditation process will have to become acquainted with it.

The facts offered up to this point are only intended to provide some sense of the Taxonomy's scope and impact. While I do have concerns with the descriptive features of the Taxonomy, my paramount concern is with its prescriptive significance. The Taxonomy has done more than simply give educators six boxes into which they may sort their learning objectives and test questions. This is true despite the fact that *Handbook 1* initially compares the Taxonomy with the Dewey Decimal System, a system which organizes books without evaluating their quality.²¹

From the outset it is clear that Bloom's mandate was not content-neutral. In describing the role of the University of Chicago's comprehensive examination system, Dr. Bloom states, "Faculty members wrote the examinations, which were to emphasize higher mental processes, for the Board of Examiners."²² This phrase, *higher mental processes* (or, more commonly, *higher order thinking*), is a frequent component of literature which takes its cues from Bloom's Taxonomy.²³ The exact demarcation of this higher order thinking is imprecise. It is often anything above the first cognitive level, Knowledge.²⁴ However defined, *Handbook 1* clearly wanted to encourage the higher-order processes. To its credit, the Taxonomy repeatedly states

²⁰See the National Center for Education's "Qualifications of Public Secondary School Biology Teachers, 1999–2000" available at <http://nces.ed.gov/pubs2005/2005081.pdf>. "Qualifications of Public Secondary School History Teachers, 1999–2000" is available at <http://nces.ed.gov/pubs2006/2006004.pdf>.

²¹Bloom, pp. 10–11.

²²Bloom in Anderson and Sosniak, p. 2.

²³An ERIC search of recent (2005–2007) educational journal article abstracts includes "higher order thinking" six times as often as "Bloom's Taxonomy" (84 versus 15).

²⁴See Anderson, Lorin A., "Research on Teaching and Teacher Education," in Anderson and Sosniak, pp. 126–127.

that lower level content is important because all higher thinking rests on a foundation of lower order thinking. Still, Bloom's frequently-quoted observation that 90 percent (or 95 percent) of instructional time (or test questions) was spent at the level of Knowledge is never taken to be anything other than an indictment against American education.²⁵ As Sosniak notes, "Favorable discussion of the Handbook centers most frequently on a single feature: the attention it calls to the fact that good education necessarily aims at more than mere recall of factual information."²⁶

Denigrating "mere knowledge" is not by any means unique to Bloom. Hirsch, for example, traces it back to William Kilpatrick's *Foundations of Method* in 1925.²⁷ Perhaps surprisingly, the dominant paradigm of colleges of education downplays the value of teaching facts. An examination of the Praxis study material reveals a contemporary teaching establishment dogmatically committed to a Constructivist philosophy of education.²⁸ Constructivism is based on an epistemic commitment that would very likely bewilder the general public and challenge its understanding of education.

Basically, constructivism views that knowledge is not "about" the world, but rather "constitutive" of the world. Knowledge is not a fixed object, it is constructed by an individual through her own experience of that object. Constructivist approach to learning emphasizes authentic, challenging projects that include students, teachers and experts in the learning community. Its goal is to create learning communities that are more closely related to the collaborative practice of the real world. In an authentic environment, learners assume the responsibilities of their own learning, they have to develop metacognitive abilities to monitor and direct their own learning and performance.²⁹

It is interesting, perhaps to the point of irony, that Bloom was a Behaviorist, not a Constructivist.³⁰ The appeal of Bloom's Taxonomy to a Constructivist agenda is clear as early as 1966. Consider the following abstract of an article entitled "The Fallacy of Facts":

Teachers are urged to provide a classroom environment less concerned with facts and more conducive for problem solving and independence of thought. The author suggests the *Taxonomy* as the most promising model for evaluation of teaching objectives, and briefly describes the six major taxonomic levels.³¹

The Taxonomy, in its call for higher order thinking, has become a tool for subverting the transmission of knowledge, even though Bloom considered that to be

²⁵This is repeated irregularly throughout the literature, but may be derived from Bloom in Anderson and Sosniak, p. 1.

²⁶Sosniak, Lauren A., "The Taxonomy, Curriculum, and Their Relations," in Anderson and Sosniak, pp. 112–113.

²⁷Hirsch, E.D., Jr., "Reality's Revenge: Research and Ideology," *American Educator* (Fall 1996), available at http://www.aft.org/pubs-reports/american_educator/fall96/revenge.html.

²⁸*Praxis Study Guide*, op. cit. The content for the *Guide* is necessarily a reflection of the content of the colleges of education.

²⁹From Hsiao, Jy Wana Daphne Lin, "CSCL Theories," at <http://www.edb.utexas.edu/csclstudent/Dhsiao/theories.html#construct>.

³⁰Rohwer, William D. and Sloane, Kathryn, "Psychological Perspectives," in Anderson and Sosniak, p. 41.

³¹Wildman, Peggy R, "The Fallacy of Facts," *Peabody Journal of Education*, 44 (1966), pp. 177–180.

the basis for all higher thinking. Consider the following quote from an Internet article called, “Building Brain Power.”³² “As discussed earlier, students did quite well on the knowledge based questions, which is to be expected but not celebrated since that represents only the most basic cognitive principles.” The research being discussed in that quotation refers to a classroom exercise involving third- and fourth-grade students.

Examples of Bloom in early education are easy to come by, even down to the level of preschool instruction.³³ The Success Guide at the Crayola™ website which summarizes Bloom’s Taxonomy is most likely not directed at the post-secondary educational market.³⁴ The HOTS (Higher Order Thinking Skills) program, developed in 1980 by Dr. Stanley Pogrow, is directed at at-risk students from the fourth to eighth grades.³⁵ These examples support the assertion that Bloom’s Taxonomy and its focus on higher order thinking has become a creature of the K–12 system.

This adds up to an extraordinary misreading of the Taxonomy. Standards intended for college students get pushed down to the K–12 system. Instead of teaching those K–12 students hierarchically, the foundation of the structure is ignored. The push is made to the highest levels of the Taxonomy, especially level six, Evaluation. Since *Handbook 1* is currently out of print (a measure, perhaps, of how carefully it is studied in the colleges of education), I will quote its *caveats* about Evaluation.

For the most part, the evaluations customarily made by an individual are quick decisions not preceded by very careful consideration of the various aspects of the object, idea or activity being judged. These might be termed opinions rather than judgments....For purposes of classification, only those evaluations which are or can be made with distinct criteria in mind are considered.³⁶

Despite these warnings, typical Evaluation questions take the form of “What do you think about x?” and “Do you agree with x?” These questions are often accompanied by praise for what education literature misidentifies as the “Socratic Method.”³⁷ The result of this strategy is to occupy class time with vacuous opining. When I speak with my fellow community college instructors, we rarely complain about students’ lack of advanced intellectual skills. Our chief source of frustration is that they haven’t mastered the basics needed to succeed in college-level work. Since I teach philosophy, I don’t expect my students to come to class knowing any content about my subject area. Still, it would be lovely if they exited high school with some

³²<http://www.csun.edu/~sml46885/cognitive%20development.html>.

³³For example, Bogan, Yolanda K. H. and Porter, Rhonda C., “On the Ball with Higher-Order Thinking,” *Teaching PreK-8* (Nov/Dec 2005), p. 46–47.

³⁴http://www.crayola.com/successguide/display.cfm?page_id=ctss2_7.

³⁵<http://www.hots.org>.

³⁶Bloom, p. 186.

³⁷Proper use of the Socratic Method involves metaphysical and epistemic commitments utterly at odds with Constructivism. Socrates was certainly not the easy-going epistemic relativist that education literature makes him out to be; he was executed by the city of Athens for, among other things, his annoying public behavior.

knowledge of world history, science, English, and geography. A large cohort (much to my frustration) doesn't know how many grams are in a kilogram or when to use an apostrophe. I have a friend, Dr. Lawrence Barker, who once taught statistics at a state university. Each quarter he quizzed his incoming statistics students about basic math. The majority, he learned, couldn't determine the square root of one without access to a calculator.³⁸ He left teaching and is now happily employed by the Centers for Disease Control.

How can a fundamentals-deprived student be expected to succeed in any course built around higher order thinking skills? What would constitute a "good" or "right" answer to a fact-free opinion question? In the absence of adequate data, the best answer, as we all know from experience, is to confirm whatever the teacher believes. Smoking in restaurants is bad, not because the student knows anything about the scientific research into second-hand smoke, but because the teacher wrinkles her nose when the subject comes up. Given the general strengths and weaknesses that young men and women bring to the classroom, this may explain some of the current underperformance of males in academia. Girls are generally better at perceiving social cues than boys are, and so they are better able to track with the teacher's biases. Boys, on the other hand, are more oriented towards systematic thinking; in general, they deal better with facts than with people.³⁹

Higher order thinking is hard. As a philosopher, I certainly want to encourage it, but only in a mature manner. In Book VII of his *Republic*, Plato said that real higher order education, education into what he called the *dialectic*, couldn't start until the student was thirty years old and had mastered conventional wisdom.

There is a danger lest they should taste the dear delight too early; for youngsters, as you may have observed, when they first get the taste in their mouths, argue for amusement, and are always contradicting and refuting others in imitation of those who refute them; like puppy-dogs, they rejoice in pulling and tearing at all who come near them.

Plato's demand that students be thirty seems excessive, but it emphasizes the gravity of higher learning. Critical reasoning isn't about blind disbelief any more than it is about blind belief.⁴⁰ It requires a solid understanding of fundamental facts, and those facts cue us to patterns of assent or skepticism. The task of instilling those basics is a noble one. The roof won't stay up without walls.

³⁸To make it worse, he wasn't even checking to see if they knew that the question has two answers.

³⁹Baron-Cohen, Simon, *The Essential Difference* (New York: Basic Books, 2003).

⁴⁰E.D. Hirsh, Jr., also makes this point in "Reality's Revenge: Research and Ideology."

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