

# Fostering Critical Thinking

John Daniel Cazier

*This paper was completed and submitted in partial fulfillment of the Master Teacher Program, a 2-year faculty professional development program conducted by the Center for Teaching Excellence, United States Military Academy, West Point, NY, 2010.*

Critical thinking is almost universally touted as one of the primary goals of education (at all levels). It is possibly the only goal of education on which there is general consensus. And yet, there is nothing close to consensus as to what critical thinking is. Within any given discipline, there is a wide variety of opinions as to what characterizes critical thinking. And these aren't readily reconcilable. Between different disciplines, the disparity is even greater. Some question whether the very nature of critical reasoning might actually vary between disciplines (Grauerholz & Bouma-Holtrop). The American Philosophical Association's definition, published in 1990 in an effort to establish some basis for consensus, identifies critical thinking as "the process of purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual considerations upon which that judgment is based."

As with most concepts we seek to define, it is all too easy to fall for a definition that is overly broad or overly narrow. Grauerholz & Bouma-Holtrop, for example, propose that we dispense with much of the controversy surrounding the nature of critical thinking by employing that term to refer to any "higher order thinking." But this approach seems to erode confidence that we are all talking about the same thing (or even one thing, or set of things, in particular) when we employ the term. Most academics suppose that critical thinking refers to a *particular* set of higher-order analytical skills.

While most academics see critical thinking as encompassing a particular skill set, many also suppose that it similarly entails certain types or amounts of knowledge. Thinking is a skill or activity. But it cannot be done without ideas of some kind – in other words, something to think about. So whether critical thinking itself entails certain knowledge, it certainly presupposes certain knowledge. And without a sufficient base of knowledge, no amount of critical thinking aptitude is likely to yield important insights.

Since critical reasoning entails doing something with information, the more information we possess, the better positioned we are to reason critically. In fact, it seems that the more information we possess, the more we can't help but think critically. We cannot process all that information without noting coherence between some and inconsistency between others. And yet, critical reasoning is more than just processing large volumes of information. It involves interrogating that information for consistency and coherence with other accepted truths.

The challenge of defining critical thinking surely stems from the fact that our thinking processes – even our simple ones – are not subject to direct observation, by either ourselves or others. We can't even be certain that the processes are the same for each of us. As a highly complex skill or process, critical reasoning is even more impervious to our deliberate scrutiny. As Grauerholz & Bouma-Holtrop note, "such highly complex learning is not easily tapped by standard measurement techniques." The oblique assessment techniques that are available don't yield very precise conclusions. They can only suggest

rough correlations between certain measures and certain outcomes. But with something so complex, correlation is clearly not causation. With no consensus on what is being studied and without reliable techniques for assessing it, the vast majority of the work done on critical thinking has been theoretical, rather than empirical.

The problems inherent in defining and studying critical thinking are similarly reflected in discussions of how to foster it. Some of the suggestions are clearly contradictory. While one article champions the advantage of one technique over another, yet another article will champion the latter technique as better than the former. Perhaps one of the staples of critical thinking pedagogy is that critical thinking must not be approached as an independent activity. Since thinking is always thinking *about something*, critical thinking should be promoted in the process of learning about a particular subject matter. But even on this intuitively plausible point, there is considerable controversy. Other instructors have found it useful to explore thinking itself more directly. Consequently, they incorporate discussion of logic or cognitive psychology into their courses. At the extreme, some researchers have even claimed considerable success in improving critical thinking via a course on cognitive psychology, wherein the only “material” explored concerned the thought process itself.

Perhaps the best candidate for consensus is simply that critical thinking is not a skill or process to be mastered in a single class. It is a relatively unnatural, higher order skill. Like learning ballet or mastering a foreign language, it must be developed over the long-run, with patient practice and correction (van Gelder).

Listed below are a number of common techniques for fostering critical thinking. Although there is no consensus on the relative merits of these, each entry on the list also offers a brief explanation of the justification for this technique as a means of fostering critical thinking.

- Reading – Whether simply reading literature or textbooks, reading introduces students to new ideas and new ways of looking at ideas. It expands their base of knowledge and experience (vicariously, at least), both essential prerequisites to improved thinking.
- Questioning (student) – Requiring students to pose questions about the material being explored invites them to focus more closely and examine implications more carefully. This reflection is itself an exercise in critical thinking. It also expands the base of knowledge on which they can subsequently reason critically.
- Questioning (instructor) – Asking students questions and then further interrogating their responses forces them to think further and deeper.
- Journaling – Journals promote reflection on the content of one’s present beliefs. Examining the content and implications of one’s present beliefs is a major component of critical thinking.
- Argumentative essays – Essays wherein one must develop a reasoned argument, perhaps also defending it against criticisms, force students to examine the relationships between claims and the implications they hold. Persuasive writing also forces students to think more deeply. Written assignments invite the kind of re-examination of one’s views which is integral to critical thinking.
- Discussion – Classroom discussion exposes students to a wider variety of perspectives. It also gives them an opportunity to air their own thoughts. And having to present one’s thoughts forces one to examine them more deliberately.
- Debate – Debate engages students actively (versus passively). Debate forces students to challenge received wisdom. When they are required to prepare a position beforehand (perhaps in groups), they take primary responsibility for their learning – a crucial step in developing critical thinking. Because debate stimulates student interest, post-debate discussion and reflection

becomes more thorough. Unfortunately, Green & Klug found that debate also had a strong tendency to bias students' final attitudes. Students were most likely to leave the debate genuinely committed to whatever position was arbitrarily assigned them for the debate.

- Modeling – Instructors can model critical thinking by evaluating in class positions that sound at first to be implausible. This not only invites students to do the same, but shows them how such examination might proceed. Students learn much by imitation.
- New media or delivery technique – Simply shifting to a new medium can help disrupt a tendency for students to be passive observers in the classroom.
- Conferences – Conferences between a teacher and several students offer several potential benefits: 1) the small group dynamic leaves each student feeling more responsible to prepare and participate, 2) students are more engaged than in the larger classroom, and 3) students are more intellectually honest.
- Case studies – Case studies invite students to explore what features of a case they see as relevant. They invite the student to take greater initiative and responsibility for his learning.
- Thought experiments – Like case studies, thought experiments invite the student to think more actively. They hold the further advantage that they need not even be plausible. When they deal with unrealistic situations, they invite students to focus on particular aspects of a situation to consider more directly the implications of individual features of a situation or problem.
- Role-playing – When students seriously attempt to adopt a different role, they are apt to experience a perspective shift on the issue they are considering.
- Concept maps & imagery – Some students are able to see relationships between ideas more clearly when those relationships are drawn out graphically.
- Written feedback – Written feedback to a student on ideas he/she expressed (in the classroom, in essay, etc.) guide the student through re-examining the strengths and weaknesses of his/her position.

Perhaps the most plausible implication to be drawn from the extent of techniques listed above is that fostering critical reasoning requires getting students to engage actively, to take responsibility for their own learning. Different disciplines, personalities, and skill sets may call for different techniques.

#### **Annotated Resource List+**

**Carr, K. S. (1990). How can we teach critical thinking. Eric Digest. [On-line]. Available HTTP: <http://www.ericdigests.org/pre-9218/critical.htm>**

Although targeted at elementary education, the three techniques explored in this article are relevant (with appropriate adaptations) for fostering critical reasoning in higher education as well. First, Carr cautions against approaching critical reasoning as an independent project from teaching content. Critical thinking is instead a way of learning content more thoroughly. Carr considers three techniques for promoting critical reasoning: 1) employ a wide variety of media to encourage students to think *while* reading, rather than as an independent activity *after* reading, 2) employ a two-stage writing process, requiring students to engage first in pre-reflective, intuitive “free-writing” to discover what they think, then revisit this through a reflective, critical re-write, considering the implications of what their original ideas, and 3) employ classification activities to promote recognition of commonalities.

**Grauerholz, Liz and Bouma-Holtrop, Sharon (2003). Exploring Critical Sociological Thinking. *Teaching Sociology*, Vol. 31, No. 4, pp. 485-496.**

This article briefly explores the problem of defining critical thinking. It supposes that one element of that problem is that critical thinking varies somewhat between disciplines. It therefore seeks to identify the specific kind of critical thinking required for sociologists. After identifying those critical reasoning skills, it considers whether they might be evaluable in an empirical study. It summarizes some of the obstacles to evaluating critical reasoning and then reviews a study designed to explore whether critical sociological reasoning is empirically evaluable.

**Green, Charles S., III and Klug, Hadley G. (1990). Teaching Critical Thinking and Writing Through Debates. *Teaching Sociology*, Vol. 18, No. 4, pp. 462-471.**

Green and Klug explore whether debates might be a more efficient means than writing of fostering critical thinking. They suggest that critical thinking requires challenging one's views and that fostering critical thinking requires students to engage actively with a topic. Class debates provide just such an opportunity. This article reports on their experiment with debate as a substitute and supplement to critical essays and concludes that replacing some traditional writing assignments with graded (and researched) debate assignments proved both more efficient and more effective than writing assignments alone in developing critical thinking.

**Hanley, Gerard L. (1995). Teaching critical thinking: Focusing on Metacognitive Skills and Problem Solving. *Teaching of Psychology*, Vol. 22, Issue 1, pp. 68-72.**

This article departs for the standard view that critical thinking is best developed in the context of studying some other content. Hanley taught a critical thinking course that focused specifically on learning to understand the thinking process and learning to deliberately select the thinking skills one brings to bear on a problem. This article reports his analysis of student surveys he administered to determine the impact of this approach on his students critical thinking and problem solving skills. His study focuses exclusively on students' perceptions of how the course impacted their critical reasoning and problem solving skills.

**Hughes, Collin (2003). Some Thoughts on Critical Thinking. *Rocky Mountain Review of Language and Literature*, Vol. 57, No. 2, pp. 57-61.**

This article seeks to generate questions, or an awareness of a problem, more than offer suggestions on promoting critical thinking. Hughes relates an epiphany gained at a teaching workshop wherein the participants were deliberately attempting to be open-minded and unconventional in evaluating pedagogy. And yet, despite their best intentions, they utterly failed to appreciate the authenticity and sufficiency of a non-traditional response offered to a question they faced. He employs this anecdote to emphasize the influence that convention and tradition have on our worldview. He seeks to demonstrate that our understanding is always limited and that teachers must work to overcome the tendency to see themselves as repositories of truth.

**O'Neill, Eileen and Dluhy, Nancy M. (1997). A Longitudinal Framework for Fostering Critical Thinking and Diagnostic Reasoning. *Journal of Advanced Nursing*, 26, 825-832.**

O'Neill and Dluhy explore the relationship between critical thinking and the diagnostic reasoning needed of health practitioners. They hypothesize that these skills are distinct, even if related, and that improvements in one don't necessarily translate into improvements in another. Diagnostic reasoning is often a matter of pattern-recognition (i.e., recognizing these symptoms as similar to those seen before) more than it is a matter of any particular skill set. And pattern recognition is much a matter of experience. This discussion highlights the importance of knowledge to critical thinking. Such thinking is dependent upon the possession of sufficient information. One cannot think critically when one doesn't possess many facts to reflect upon. The article even suggests that there are perils, including mental

paralysis and reduced confidence in one's mental faculties, to infusing reflective exercises into a curriculum before students have mastered enough basic information. The article proposes a framework for further research on the relationship between critical thinking and diagnostic reasoning.

**Staib, Sharon (2003). Teaching and Measuring Critical Thinking. *Journal of Nursing Education*, Vol. 42 No. 11, pp. 498-508.**

This article provides three useful surveys: 1) a summary of studies of various critical thinking strategies, 2) an outline of various techniques to foster critical thinking in the classroom, and 3) an overview of assessment vehicles for evaluating critical thinking. While it draws no firm conclusions concerning effectiveness of each approach to fostering critical thinking, the presentation of each technique is stimulating.

**Underwood, Marion K. and Wald, Rebecca L. (1995). Conference-style learning: A Method for Fostering Critical Thinking with Heart. *Teaching of Psychology*, Vol. 22, Issue 1, pp. 17-21.**

This article, co-authored by a teacher and a student, champions small group conferences as a means of fostering critical thinking "with heart." The relative anonymity of larger class settings sometimes result in students not thinking honestly enough. They don't consider the impact of their reasoning on their own feelings or those of others. They may reason themselves into positions which they are not truly willing to live with. Smaller conferences keep students honest and help maintain the link between their critical reasoning and their underlying values. They also help keep the students responsible for their learning. This article explores the benefits and pitfalls of such conferences as well as suggests ways to use them most effectively.

**Van Gelder, Tim (2005). Teaching Critical Thinking: Some Lessons from Cognitive Science. *College Teaching*, Vol. 53, No. 1, pp. 1-6.**

Cognitive science offers us some useful insight into how critical reasoning might best be developed. Van Gelder offers six insights gleaned from cognitive science. They are: 1) critical reasoning is hard, so don't expect too much, too fast; 2) developing critical reasoning requires constant, deliberate practice; 3) critical reasoning exercises should aim to show how those skills can be applied to other situations; 4) learning the theory behind critical reasoning improves reasoning skills; 5) mapping out arguments facilitates critical reasoning; and 6) we have ingrained tendencies to maintain our existing beliefs, even in the face of opposing evidence/argument.

**Wade, Carol (1995). Using Writing to Develop and Assess Critical Thinking. *Teaching of Psychology*, Vol. 22, Issue 1, pp. 24-28.**

In this brief, but excellent article, Wade identifies eight essential elements of critical thinking and offers a few of her techniques or prompts for encouraging students to develop each through written assignments. She insightfully suggests that one obstacle to fostering critical thinking is students that are so eager to learn that they desire to be fed information rapidly, rather than laboriously working through the reflective process of discovering new truths on their own from those they already possess. Her examples in each case are thought provoking and help demonstrate the value she attributes to written work – its tendency to encourage students to think more cautiously and deliberately.

### **Additional Readings**

- Angelo, T. A. (1995). Beginning the dialogue: Thoughts on promoting critical thinking: Classroom assessment for critical thinking. *Teaching of Psychology*, 22(1), 6-7.
- Beyer, B. K. (1995). *Critical thinking*. Bloomington, IN: Phi Delta Kappa Educational Foundation.
- Carroll, Robert Todd (2007). *Teaching Critical Thinking*. From address given at Critical Thinking Workshop, Las Vegas, January 18, 2007. Available HTTP: <http://skeptdic.com/essays/teachingCT.pdf>.
- Center for Critical Thinking (1996a). The role of questions in thinking, teaching, and learning. [On-line]. Available HTTP: <http://www.criticalthinking.org/University/univlibrary/library.ncl>
- Center for Critical Thinking (1996b). Structures for student self-assessment. [On-line]. Available HTTP: <http://www.criticalthinking.org/University/univclass/trc.ncl>
- Center for Critical Thinking (1996c). Three definitions of critical thinking [On-line]. Available HTTP: <http://www.criticalthinking.org/University/univlibrary/library.ncl>
- Cooper, J. L. (1995). Cooperative learning and critical thinking. *Teaching of Psychology*, 22(1), 7-8.
- Cotton, Kathleen (1991). Teaching Thinking Skills. *School Improvement Research Series*. Available HTTP: <http://www.nwrel.org/archive/sirs/6/cu11.html>.
- Galotti, Kathleen M. (1995). Reasoning about reasoning: A course project. *Teaching of Psychology*, 22(1), 66-68.
- Geertsen, H. Reed (2003). Rethinking Thinking About Higher-Level Thinking. *Teaching Sociology*, Vol. 31, No 1, pp. 1-19.
- Jones, E. A. & Ratcliff, G. (1993). Critical thinking skills for college students. National Center on Postsecondary Teaching, Learning, and Assessment, University Park, PA. (Eric Document Reproduction Services No. ED 358 772)
- King, A. (1995). Designing the instructional process to enhance critical thinking across the curriculum: Inquiring minds really do want to know: Using questioning to teach critical thinking. *Teaching of Psychology*, 22 (1) , 13-17.
- McBurney, Donald H. (1995). The problem method of teaching research methods. *Teaching of Psychology*, 22(1), 36-38.
- McDade, S. A. (1995). Case study pedagogy to advance critical thinking. *Teaching Psychology*, 22(1), 9-10.
- Oliver, H. & Utermohlen, R. (1995). An innovative teaching strategy: Using critical thinking to give students a guide to the future.(Eric Document Reproduction Services No. 389 702)
- Robertson, J. F. & Rane-Szostak, D. (1996). Using dialogues to develop critical thinking skills: A practical approach. *Journal of Adolescent & Adult Literacy*, 39(7), 552-556.

Scriven, M. & Paul, R. (1996). Defining critical thinking: A draft statement for the National Council for Excellence in Critical Thinking. [On-line]. Available HTTP: <http://www.criticalthinking.org/University/univlibrary/library.nclk>

Strohm, S. M., & Baukus, R. A. (1995). Strategies for fostering critical thinking skills. *Journalism and Mass Communication Educator*, 50 (1), 55-62.

Tsui, Lisa (2000). Effects of Campus Culture on Students' Critical Thinking. *The Review of Higher Education* 23.4, pp. 421-441.

Tsui, Lisa (2002). Fostering Critical Thinking Through Effective Pedagogy: Evidence from Four Institutional Case Studies. *The Journal of Higher Education*, Vol. 73, No. 6, pp. 740-763.