

Effective teaching of critical thinking: how do we do it?

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Abstract

Whilst there is a long-standing debate about how critical thinking is defined, there is a more pressing pedagogical issue. Is our teaching of critical thinking effective in improving critical thinking capacities in students? According to a series of reports conducted in the 1990s in America (Willingham: 2007) there has been little improvement in critical thinking capacities in university graduates, despite a national focus on teaching critical thinking skills. Abrami et al's more recent reviews (2008; 2015) support that finding. Using Abrami et al's meta-analyses as a framework, I want to propose some ways that the effectiveness of critical thinking instruction can be improved. I put forward the idea that 1) instruction should be made available to academics on how to teach CT and/or on how their CT teaching can be made more effective. Part of that proposal includes the more controversial idea of adopting a standard critical thinking teaching rubric.

Benefits of critical thinking

It is generally believed that some thinking practices are better than others and that the better thinking practices are more likely to lead to more appropriate beliefs or outcomes than others. This will include, but won't be limited to, making a contribution towards knowledge and coming up with viable solutions to existing problems. The main assumption behind the teaching of critical thinking in schools and higher education institutions is the belief that it is one of the better thinking practices. Developing a critical thinking capacity and requisite skills will make students better thinkers, and this is a desirable trait for graduates to have.

This is a belief that I have always held. My own teaching of critical thinking rests on the belief that a student's thinking practices can be improved, and that applying critical thinking techniques to a problem, a claim, a belief, a practice, or a piece of research, is the best way to develop those skills within Academia.

Is current critical thinking instruction effective?

In 1983, a report by the National Commission on Excellence in Education, in America, found that most 17-year-olds did not possess 'higher-order' intellectual skills, nearly 40 percent of them could not draw inferences from written material, and only one-fifth could write a persuasive essay. A survey by Norris in 1985 (p. 45) concluded there was 'little evidence on the long-term impact of instruction in critical thinking, despite the fact that the vision of such impact is central to the justification of CT instruction.' Further research conducted in the 1990s in America indicated that, despite a national focus on teaching critical thinking skills, there was little improvement in critical thinking capacities in university graduates compared to other student cohorts. According to Willingham (2007), this cast doubt on the efficacy of

critical thinking instruction, given how unsuccessful academics appear to have been in improving CT in their students. Depressingly, more recent meta-analyses of the literature (Abrami et al 2008), found that critical thinking is not the guaranteed outcome of higher education as is often assumed. They found that there was no or very little difference in the development of a critical thinking capacity between high school and university graduates. They also found that there was no significant improvement in critical thinking development across different degrees.

Given the range of definitions of critical thinking in the literature, as well as the range of pedagogies and CT models in existence, it is unlikely there will be much consistency in what academics are teaching under what has now become a rather broad rubric. That diversity will also be reflected in what is expected, evaluated and measured as an example of good CT practice. These variations not only make comparisons difficult but are likely to be contributing to highly variable outcomes. While some teaching methods may be highly effective, others may contribute little to critical thinking improvement.

What had limited/no effect

A second meta-analysis by Abrami et al (2015) found just that. They refined their analyses to make it more rigorous, ruling out studies that used less standard versions or unverifiable evaluation measures. By measuring effect size based on reported test measures, they found that the effect of instruction on critical thinking skills was highly heterogeneous, a not unexpected result. Nevertheless, they were able to isolate several variables that were significant, producing an effect size greater than zero. So, while in some cases there was little change, as suggested above, in others there was a significant improvement in critical thinking skills as registered by validated tests such as the California Critical Thinking Test, Cornell Critical Thinking Test and the Watson-Glazer Critical Thinking Test.

Four major variables were coded as being potentially relevant to the outcomes. These were age and study level (K-12; tertiary); type of intervention/instruction; pedagogical grounding (teacher); collaboration/ peer support (student). It was interesting which variables had little or no impact on the effectiveness of critical thinking instruction:

- Age was not significant except in adults who showed less improvement than high school students
- Educational level not significant; some success at all levels, significantly >0 up to graduate level
- Peer collaboration had no effect
- Subject matter/Faculty showed no significant differences; almost perfect overlap between STEM and not STEM. significantly >0 for all subject areas
- Duration of intervention did not affect CT effect sizes; significantly >0 for all (3hours- > semester)

What had the greatest effect

The two most significant variables that had a direct impact on the effectiveness of critical thinking instruction were 1) the type of intervention or instruction and 2) the pedagogical grounding of the instructor. The type of intervention produced the most significant variations in effect size. This is particularly relevant within the higher educational institution context, given the debate about generic versus discipline-embedded teaching of critical thinking. Of the four different models of instruction they identified – generic, immersion, mixed, and

infusion – the mixed method (discipline content plus separate explicit CT instruction) produced the most significant improvement. The immersion method was by far the least effective.

The second most significant variable was the level of expertise of the instructor. There was a direct relationship between the (lack of) improvement of critical thinking skills and the level of expertise of the instructor. It is commonly assumed, including by me, that all academics are proficient critical thinkers and understand what critical thinking is *by virtue of their degree/doctorate and their position as a topic lecturer*. Given the findings by Abrami et al, this is not something we should be assuming anymore. Elder (2016) reported on another study of 38 public universities and 28 private colleges in America which showed very few prospective high school teachers were being taught critical thinking *overtly* and few received instruction in how to teach it. Sadly, the same study showed that the *professors* of education themselves could not articulate what critical thinking was and, amongst other things, did not make a connection between it and reasoning.

More and more, we need to push our students to critically engage with ideas and to express their views in logical, well-reasoned papers that deal fairly with opposing points of view. There is currently a range of diverse political, social and economic views in the public sphere, all of which deserve the same element of critique and exposure to a set of rigorous intellectual criteria. There is also an equivalent set of positions that are ill-founded, poorly researched and based on dubious facts or subjective opinion which also need to be thoroughly and publicly critiqued. How do we get students to genuinely engage in this process if the very academics who are trying to teach these skills lack them themselves? As Abrami et al demonstrate, if the teachers are not themselves critical thinkers, they will not be able to develop the skills in their students. This then becomes an exponential problem as those students go on to become academics or teachers themselves, or influential members in the public sphere.

Discussion – what are possible solutions?

It is almost a truism that the more you know in a particular field, the better able you are to impart your knowledge. So it makes sense that for an academic to be an effective teacher of critical thinking they must have expertise in critical thinking themselves. However, this may also not be enough without some training in how to then teach critical thinking effectively. Given that research indicates that academics vary considerably in their levels of knowledge and understanding of even the basic tenets of critical thinking, a first step would be to provide some workshops on critical thinking for teachers who want them. At a minimum, these could be used to 1) find out what they know and how they currently teach CT and 2) offer practical ways of improving their teaching practice in this area.

This suggestion is not without controversy. So I want to raise the following points for discussion based on what has been presented here, to see what others think about this topic. Here's a summary of the discussion and discussion points:

- Critical thinking is not an automatic outcome of tertiary study
- It does not automatically result as a byproduct of standard instruction in a content area.
- Pedagogical instruction/skill of teachers are critical in developing CT
- These can't be assumed just because s/o is an academic
- Academics may need to have expertise in CT and/or be trained in CT instruction

- Pedagogical method counts – what we do in the class
- Critical thinking instruction needs to focus overtly and self-consciously on the improvement of thinking, and the learning experience needs to include multiple examples across domains in order to maximize transfer.
- Need to agree to some extent on what falls under critical thinking

A possible Critical Thinking model

[Max Black (1946), inspired by Dewey, has been credited with coining the term ‘critical thinking’ but the actual practice of thinking critically, if not the terminology, is much older, and has its roots in early Platonic discourse represented by the Socratic dialogues, Pyrrhonian scepticism and Aristotle’s later syllogistic reasoning. Early Indian philosophy also used a 5-step syllogistic argument similar to Aristotle’s 3-step form. The historical continuation of the emphasis on written critique and argument is evident in such thinkers as Aquinas, Francis Bacon and his *Idols of the Tribes* (which encapsulate all the barriers to good thinking), and Descartes with his admonition to doubt first. The rationale for questioning established beliefs and ideas was in recognition of the fact that appearances can be deceptive and that beliefs were inconsistent and often the result of ignorance and prejudice. With the development of science and technology, it was apparent that some prior claims about the world were actually false and some established beliefs were contradicted by new-found knowledge. At the same time, public disagreement and diversity of opinion about the (moral, social, physical) world increased the necessity for strong evidence, sound reasoning and persuasive arguments. This is the environment in which the concept of critical thinking most commonly referred to within academic fields has its roots, which is why the ‘argumentative essay’ is often seen as its primary vehicle. While a belief in absolute truth and objectivity were often assumed, the mechanisms, methods or tools of critical thinking also uncovered mistakes in reasoning, revealed ambiguity, and demonstrated the importance of context and plurality. According to van Gelder (2005), identifying and analysing arguments is still one of the most effective tools for improving CT skills in students. These techniques could continue to be deployed effectively without taking on board the ontological assumptions which created them.]

Reference List

- Abrami P C, Bernard R. M, Borokhovski E, Wade A and Michael A (2008). ‘Instructional Interventions Affecting Critical Thinking Skills and Dispositions: A stage 1 meta-analysis,’ *Review of Educational Research*; Dec; 78, 4; 1102-1134 <http://rer.aera.net>
- Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C. A., and Persson, T. (2015). ‘Strategies for Teaching Students to Think Critically: A Meta-Analysis,’ *Review of Educational Research* 85(2): 275-314 · June
- DasBender G, (2011). ‘Critical Thinking in College Writing: From the Personal to the Academic,’ *Writing spaces : readings on writing. Volume 2*, (eds) Charles Lowe and Pavel Zemliansky.
- Elder L. (2016). *Diversity: making sense of it through critical thinking*, <http://www.criticalthinking.org/pages/diversity-making-sense-of-it-through-critical-thinking/489>. Accessed May, 2016.
- Ennis R. (1987). ‘A taxonomy of critical thinking abilities and dispositions,’ J. Baron and R. Sternberg (Eds.), *Teaching thinking skills* (pp. 9-26). New York, USA: W. H. Freeman.
- Facione P. (1990). *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*. Millbrae, CA: The California Academic Press.

- Moore T. J. (2011), *Critical thinking and language: The challenge of generic skills and disciplinary discourse* (Bloomsbury Academic, PP. X, 245).
- National Commission on Excellence in Education, 1983, *A Nation At Risk*
<http://www.studentsatthecenter.org/resources/nation-risk-imperative-educational-reform>
- Norris S. (1985). 'Synthesis of research on critical thinking,' *Educational Leadership*, 40- 45.
- Van Gelder T. (2005). 'Teaching critical thinking: some lessons from cognitive science,) *College Teaching*, 53:1.
- Willingham D. (2007). 'Critical Thinking: why is it so hard to teach?' *American Federation of Teachers*, www.aft.org/sites/default/files/periodicals/Crit_Thinking.pdf