

# Critical Thinking – a tangible construct?

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*Are some outcomes of education too intangible to be measured? No doubt, there are some that we speak of often, like critical thinking... that [is] so difficult to define satisfactorily that we have given up trying to define [it] specifically. To this extent, they are intangible [and] hard to measure.* (Ebel, 1965)

Forty years on from Ebel's quote, the testing of Critical Thinking has become a flourishing area. In the UK, tests which incorporate a Critical Thinking element include the BioMedical Admissions Test (BMAT), Thinking Skills Assessment (TSA), UniTest, UK Clinical Schools Admissions Test (UKCAT) and Watson Glaser Critical Thinking Appraisal UK (WGCTA-UK). Frequently the stated purpose of these tests is to help Higher Education establishments make admissions decisions, a situation with much precedent in the US where the Law Schools Admissions Test (LSAT) and Medical Colleges Admissions Test (MCAT) are de rigueur for applicants. It seems that to think critically is considered an advantageous or even essential ability for university students on some courses.

But what is Critical Thinking? Is Ebel's pessimistic view now outdated? This article hopes to introduce some of the debates within the construct of Critical Thinking and some of the implications for assessment of Critical Thinking. There are a number of protagonists within the field, and their definitions of what constitutes the construct of Critical Thinking vary enormously: 'chaos at the core' as Benderson wrote in 1990.

The early work of Robert H. Ennis, University of Illinois, propounded a 'pure skills' approach to Critical Thinking. Critical Thinking was defined as 'the correct assessing of statements' (Ennis quoted in Siegel, 1988) and was appended by a list of aspects of statement assessment and criteria. The caveat to this long list is that a complete set of criteria for Critical Thinking cannot be established, that 'intelligent judgement' is also required.

Thus, there are no clear boundaries defining the outer limits of what constitutes Critical Thinking. The implication of Ennis' early position (the 'pure skills' approach), is that if you can pass a test in Critical Thinking, you have Critical Thinking skills. The weakness in this definition is that someone may possess such skills and yet never use them. To be a critical thinker and not just be able to be one should be an important aspect of the definition. Ennis' (1996) later definition, 'Critical Thinking is reasonable, reflective thinking that is focused on deciding what to believe or do', introduces decision-making into the concept and the idea that Critical Thinking should affect a critical thinker's behaviour, that is, Critical Thinking is exercised and is not just pure skills.

Alec Fisher, Director of the Centre for Research in Critical Thinking at the University of East Anglia, insists that it must be a taught skill, and one that is transferable to other subject domains. He claims an important aspect is metacognition, that is, thinking about one's thinking. Arguably, metacognition can only be achieved through some conscious effort by reference to a good model of thinking. This is where the *teaching* of Critical Thinking comes into play. Additionally, Fisher argues that a critical thinker should exercise and apply these Critical Thinking skills not

just in academic studies but in many situations (where appropriate). His definition is:

*Critical Thinking is skilled and active interpretation and evaluation of observations and communications, information and argumentation.* (Fisher and Scriven, 1997)

Richard Paul, founder and director of Sonoma State University's Centre for Critical Thinking, argues that Critical Thinking courses often teach 'weak-sense' Critical Thinking, where the concepts within can become so atomistic that they are no longer Critical Thinking (just a series of 'moves'). Paul (1992) advocates Critical Thinking in a 'strong' sense. Critical thinkers should look at 'argument networks' or 'world views' and not merely reject an argument network on the basis of an atomistic flaw. One's deepest beliefs and ethical, moral and socio-cultural standpoints should be subject to Critical Thinking. Thus in order to think critically, one must use these skills on oneself; it is a reflective process.

*Critical Thinking is disciplined, self-directed thinking which exemplifies the perfections of thinking appropriate to a particular mode or domain of thinking.*

John McPeck (1981) of the University of Western Ontario suggests that it cannot be taught as a standalone subject – one is always thinking about something – so that in theory one might offer Critical Thinking for Physics, or Critical Thinking for Geography.

*In isolation from a particular subject, the phrase "Critical Thinking" neither refers to nor denotes any particular skill. It follows from this that it makes no sense to talk about Critical Thinking as a distinct subject and that it therefore cannot be profitably taught as such. [Critical Thinking] ... is both conceptually and practically empty.*

In short, the construct of Critical Thinking is not precisely defined, nor is it the case that there is a single agreed definition.

Some of this division stems from the experts' fields (though all of the above are involved with the informal logic movement). Those from a philosophical background are interested in employing the tools of logic and reasoning in order to illuminate fundamental truths (with a tradition of more than 2,000 years of reasoning and argumentation). Meanwhile, those from a psychological background, for example, Sternberg and Halpern, are concerned with the thinking process and problem solving rather than logical reasoning. This tradition has evolved not from philosophical argument and discourse, but through experimentation on real subjects. Thus, psychologists may view the philosophers as giving an account of some 'ideal' Critical Thinking abilities, rather than actual performance where limiting factors (e.g. time, information, working memory capacity, motivation) come into play. There are differences between rules of logic and rules of thought. So, psychologists have been concerned with characterising Critical Thinking as it is performed under the limitations of the person and the context or environment. This notion is reflected in the definition of Professor Robert Sternberg (1986) of Yale University:

*Critical Thinking comprises the mental processes, strategies, and representations people use to solve problems, make decisions, and learn new concepts.*

Thus, one expects from psychologists a more *descriptive* account of Critical Thinking, rather than an *aspirational* account.

Psychologists' definitions and taxonomies of Critical Thinking tend to emphasise problem solving rather than logic. Sternberg's psychological taxonomy of Critical Thinking skills involves metacomponents (e.g. formulating a strategy, monitoring progress in solving a problem), performance components (e.g. inductive and deductive reasoning, spatial visualisation) and knowledge-acquisition components (e.g. encoding and organising information). Interestingly, Critical Thinking tests which stem out of the cognitive tradition do not always separate out Critical Thinking from intelligence (e.g. Sternberg's Triarchic Test of Intellectual Skills).

Unsurprisingly, representatives from each tradition counter attack. Paul (quoted in Benderson) rejects the psychological account on the basis that the puzzles posed by psychologists as critical thinking teaching aids are self-contained or 'monological', that is, are simplistic in that they have a single correct answer and involve adopting just one frame of reference ('weak sense' Critical Thinking). 'True' Critical Thinking should involve 'multilogical' problems, involving multiple frames of reference or argument networks with no single correct answer; only then can a student reflect upon and evaluate their own beliefs. However, Sigel, an ETS researcher notes that 'Philosophers tend not to be empiricists... they just use themselves as sources of authorities. The psychologist is an empiricist who wants to create data that educators can then validate with their own experience.' (quoted in Benderson 1990)

Is there any definition to which the majority of experts would subscribe? Possibly the definition derived from a Delphi study<sup>1</sup> conducted in the United States by Facione (1990). In this study, 46 Critical Thinking experts, consisting of 24 panellists associated with philosophy (including Ennis and Paul), 9 associated with the social sciences, 2 with physical sciences and 10 with education formed a consensus on many aspects of Critical Thinking, including a definition and list of critical skills. The definition, quoted in full, reads as follows:

*We understand Critical Thinking to be purposeful, self-regulatory judgement which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgement is based. CT [sic] is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgements, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines*

*developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.*

It is worth noting that this definition has two dimensions to it: cognitive skills and affective dispositions. Facione also provides a detailed taxonomy of skills and sub-skills which helps to define the outer limits of Critical Thinking. However, some commentators regard the list as over-inclusive especially with regard to affective dispositions. Fisher and Scriven (1997) comment that the work is flawed in defining the Critical Thinker rather than Critical Thinking. Certainly, cognitive skills are more readily assessed than affective dispositions in traditionally styled examinations but perhaps, logically, if one wanted to assess the degree to which someone is a Critical Thinker, a personality test would be more appropriate?

## Some issues in Critical Thinking literature regarding the construct and their implications for pedagogy and assessment

### Thinking which is *not* Critical Thinking?

The corollary to disagreement about what *is* Critical Thinking, is differences of opinion concerning what *isn't*. There tend not to be clearly defined outer-edges of the construct. The Facione Delphi study gives some clues:

*Not every useful cognitive process should be thought of as CT. Not every valuable thinking skill is [a] CT skill. CT is one among a family of closely related forms of higher-order thinking, along with, for example, problem solving, decision making and creative thinking. The complex relationships among the forms of higher-order thinking have yet to be examined satisfactorily.*

It may matter less to Critical Thinking teachers than to Critical Thinking test-writers as to what defines the outer limits of the discipline. Test-writers face criticisms of construct validity, for example, that their test is really testing the candidates' ideology, common or background knowledge, intelligence or creative thinking rather than, for example, inference, analysis or interpretation skills.

### Critical Thinking pedagogy: separate or infused?

Not only is there some lack of clarity in the literature over what to include within a Critical Thinking curriculum, there is also some inconsistency concerning how the curriculum should be constructed. Is Critical Thinking:

- (a) something which should be taught as a separate discipline, or
- (b) something which is embedded or infused, either implicitly or explicitly, within other subject domains?

Whilst all Critical Thinking protagonists support the view that Critical Thinking should be part of students' educational experience, the conflict is whether its provision should be embedded in subject domains or stand alone as a separate academic discipline. Certainly, McPeck (1981) would, if anything, support the former view, asserting that:

*To the extent that Critical Thinking is not about a specific subject, X, it is both conceptually and practically empty. The statement "I teach Critical Thinking", simpliciter, is vacuous because there is no generalised skill properly called Critical Thinking.*

1. Briefly, the Delphi Method involves the formation of a panel of experts, who participate in a number of rounds of questions involving them sharing opinions. The experts can reconsider them in the light of comments offered by other experts. The overall agenda is to move towards a position of consensus (if not unanimity) on a particular subject.

However, this conflicts with the view of Fisher (2001):

*Increasingly, educators have come to doubt the effectiveness of teaching 'thinking skills' in this way [implicitly] because most students simply do not pick up the thinking skills in question. The result is that many teachers have become interested in teaching these skills directly...taught in a way that expressly aims to facilitate their transfer to other subjects and other contexts.*

### Is Critical Thinking an explicitly teachable skill or a natural disposition?

*Most of us would claim that we can teach critical thinking, but not be too sure about whether we can change someone's personality.*  
(Fisher and Scriven, 1997)

Whilst some definitions promote Critical Thinking as an explicitly teachable skill, others make more of dispositions. For instance, Ennis's early view of Critical Thinking advocated a 'pure skills' approach, while his later work advocates a 'skills plus tendencies' position. One such tendency involves 'open-mindedness' (Ennis, 2002). As a synonym for openness, this is included as one of the five traits in the so-called 'Big 5' or Five Factor Theory of Personality (McCrae and Costa, 1996) and is widely accepted as a broad personality trait, which many view as fixed in amount or stable throughout adulthood.

McPeck's definition, 'the propensity and skill to engage in an activity with reflective skepticism' (1981), implies another disposition, akin to a 'spirit of inquiry', also present in the definitions advocated by Perkins, Jay and Tishman (1993) in their article aptly entitled 'Beyond abilities: a dispositional theory of thinking'. Interestingly, some critical thinking tendencies (e.g. open-mindedness, being questioning, observant) have some convergence with Guy Claxton's Positive Learning Dispositions (2006), that which a 'capacity to learn' comprises. Despite the use of the term 'disposition', his view is that developing (or teaching) dispositions is a fruitful endeavour. He deliberately clarifies his view of a disposition as 'merely an ability that you are actually disposed to make use of.'

Whether Critical Thinking is an explicitly teachable skill or a (fixed) natural disposition is a pertinent question, both for Critical Thinking teachers as well as people who devise and test Critical Thinking. Equally, what are the valid inferences end users might make from a score or mark obtained on a Critical Thinking Test? Assuming that one can infer that candidate Z has X amount of the ability at the moment of testing, the question is whether one believes this indicates a permanent or transient measure of that person as a Critical Thinker.

### Conclusions

So, does Ebel's appraisal of Critical Thinking still hold true forty years on? Far from giving up, there has been considerable endeavour to define Critical Thinking. These attempts have certainly made the concept increasingly tangible and easier to measure, although there is still some way to go before a single definition is accepted by all. Furthermore, the

introduction into the arena of over 20,000 students in about 1,000 educational institutions wishing to have their achievement in Critical Thinking certificated has added an additional dimension to Ebel's 'hard to measure' statement. Ebel was undoubtedly right – Critical Thinking is difficult to define satisfactorily and hard to measure. But we have not given up trying.

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