

## The Four Critical Thinking Skills

### **Abstract**

This article discusses critical thinking skills and values, the differences between critical thinking and problem solving, and which subjects are best for developing critical thinking.

### **Definition of Critical Thinking**

***'Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do.'***  
(Ennis 1989)

The philosopher Robert Ennis' definition is widely used and captures the idea of critical thinking succinctly. Being **"reasonable"** means we have to be able to give reasons for what we believe and what we decide to do; that is, we can make an argument for them. Being **"reflective"** means we actively think things through for ourselves, raise questions and find information, rather than learning passively, jumping to a conclusion or just accepting what we are told.

However, this is not enough to understand the concept of critical thinking completely. Two other parts are needed: critical thinking skills and values.

### **Four Critical Thinking Skills**

There is wide agreement that critical thinking is a set of skills which can be learned, practiced and improved. The outcome of a critical thinking process is to produce one's own argument for one's own conclusion. The four skills which are required for this are as follows:

- **Interpretation:** categorising information; decoding conventions; clarifying meaning.
- **Analysis:** detecting and analysing arguments to identify their structure, conclusion, premises (and missing premises) and logical relations; sorting out irrelevant material.
- **Evaluation:** judging the truth of statements, the credibility of sources and the strength/validity of arguments; anticipating objections and how additional information might affect an argument.
- **Argument Creation:** supporting premises; formal and informal reasoning; presenting arguments and drawing conclusions; considering alternatives; justifying methods.

Interpretation comes first: clarifying meaning and considering whether information can be taken at face value. Analysis and evaluation are for dealing with argumentative inputs from other people, as well as scrutinising one's own thoughts. Argument creation is the synthesis of one's thinking with those inputs to reach a reasonable decision. That is the centre of critical thinking.

### **Critical Thinking Values**

There is also agreement that certain dispositions or values are necessary to be a good critical thinker. Teachers need to inculcate these values in their students and students will reinforce these values when they practice critical thinking.

- **Rigorous:** focussing on the problem; being clear, precise, well-argued, well-structured and succinct.
- **Fair:** seeking the truth or the best decision; representing information honestly; being willing to change opinion.
- **Open:** being curious and questioning; seeking alternative points of view.
- **Confident:** thinking for yourself; going beyond the easy answer.

## **Is Critical Thinking the Same as Problem-Solving?**

Critical thinking is one of a family of general thinking skills, including creative thinking, problem-solving, metacognition, decision-making, representation and summarising. There is controversy over the relation of critical thinking to problem-solving. Some claim problem-solving to be one of the critical thinking skills. Others make critical thinking a subordinate part of problem-solving skills. We think both views are unhelpful, because they take the focus away from what is unique about critical thinking.

Problem-solving and critical-thinking overlap. In education, the extent to which they are the same depends on the subject matter and the level. In STEM (Science, Technology, Engineering, Maths) subjects, lots of good problem-solving thinking is not critical thinking. But in HASS (Humanities, Arts, Social Sciences) subjects, problem solving is often purely an exercise in critical thinking.

To illustrate this difference, we can look at some typical A level exam problems.

Religious Studies (HASS)	<i>"To what extent was Jesus merely a political liberator?" "'Good' is meaningful. Discuss."</i>
Chemistry (STEM)	<i>"Calculate a value for the enthalpy of lattice formation of MgO." "Explain the bonding in and the shape of a benzene molecule."</i>

The Religious Studies problems require analysis and evaluation of competing arguments, some interpretation of sources, and the creation of an argument for the student's point of view. These are all critical thinking skills. The Chemistry problems require understanding of chemistry, mathematical skill and some creativity, but not critical thinking skills.

Put simply, critical thinking is needed when the answer to the question could go 'either way' and the student must make an argument for their point of view. In STEM subjects up to A Level, the correct answer is never in doubt, but in HASS subjects, it is. This is not to say that STEM subjects never require critical thinking skills. All subjects require critical thinking at a high enough level, where there are problems on which even the academics disagree. But in secondary school, the HASS subjects deal with open-ended problems from at least year 7 onwards. Therefore these are the most suitable subjects for developing critical thinking skills at school.

Critical thinking is a tightly-defined concept which comprises clearly identified skills. The subject matter of critical thinking is argument. We interpret, analyse, evaluate and create arguments, but we don't solve them. Problem-solving is more of a procedure or algorithm than a defined set of skills; the skills needed to solve a given problem depend on what the problem is (and may include critical thinking skills). For these reasons, we do not think it is useful to include problem-solving as a critical thinking skill, or vice-versa, although we acknowledge the close connection between these concepts.

## **Notes on Sources**

The most authoritative sources on the definition of critical thinking and of critical thinking skills and values are Facione (1990), usually referred to as the 'Delphi Report', and Fisher (2021). Fisher draws heavily on the Delphi Report and gives a brief history of the development of the definition of critical thinking.

The Delphi report's description of the critical thinking skills is extremely long, and comprises 6 skills: interpretation, analysis, evaluation, inference, explanation and self-regulation. In the above summary of the critical thinking skills, we have shortened their descriptions and also simplified their list of skills in two ways:

- Combined 'inference' and 'explanation' and named it 'argument creation.'
- Merged 'self-regulation' with the list of critical thinking values.

The Delphi Report also goes into great detail about the 'dispositions' the ideal critical thinker should possess. We have simplified this into the five values summarised above, which we think capture the spirit of critical thinking.

## **Endoxa Learning**

At Endoxa Learning, we use the above summary of the definition, skills and values of critical thinking as a guide to all that we do. Our software is designed to help students acquire and practice these skills and values. [Click here](#) to see our mission statement and values.

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## **References**

Facione P.A. (1990): 'The Delphi Report - Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction'

Fisher A. 'What Critical Thinking Is' in 'Studies in Critical Thinking' 2nd Ed (2021) Edited by Blair A.J.

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