

Critical Thinking

by Olivier Serrat

Polar Opposites on a Cartesian Circle

Blaise Pascal¹ felt that “Man is obviously made for thinking. Therein lies all his dignity and his merit; and his whole duty is to think as he ought.” A contemporary of René Descartes,² Pascal is however best remembered for resisting rationalism, which he thought could not determine major truths: “The heart has its reasons, which reason does not know.” Blaise Pascal and René Descartes are reference points for two major attitudes to conscious representation of the world: although both saw reason as the primary source of knowledge, they disagreed profoundly over the competence of Man—the truth, as always, lies between faith and radical doubt.



The quality of our lives depends on the quality of our thoughts. Critical thinking is the art of analyzing and evaluating thinking with a view to improving it. Excellence in thought can be cultivated and fertilized with creativity.

The Idea of Critical Thinking...

For sure, *pace* the propensity of intellectuals to promulgate eternal truths, or at least make a lasting impression, the idea of critical thinking neither begins nor ends with Pascal or Descartes. Socrates set the agenda nearly 2,500 years ago when the “Socratic Method” established the need to seek evidence, analyze basic concepts, scrutinize reasoning and assumptions, and trace the implications not only of what is said but of what is done as well: “Knowledge will not come from teaching but from questioning.”³ Thereafter, within the overall framework of skepticism, numerous scholars raised awareness of the potential power of reasoning and of the need for that to be

¹ Blaise Pascal (1623–1662), a French mathematician, physicist, inventor, theologian, and man-of-letters, is deemed one of the great minds in Western intellectual history. Best known as a scientist, he dedicated the latter half of his life to religious study. He prefigured existentialism.

² René Descartes (1596–1650), a French mathematician and natural philosopher, helped establish the scientific method (that being a body of techniques for investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge). His required (i) accepting as “truth” only clear, distinct ideas that could not be doubted; (ii) breaking a problem down into parts; (iii) deducing one conclusion from another; and (iv) conducting a systematic synthesis of all things.

³ Different kinds of thinking underpin dogmatic and critical approaches. The former is, fundamentally, a matter of evaluative judgment: it is the usual way of thinking or, to be precise, not thinking; the second suspends explanatory (or value) schemes to examine what might be found in the subject of study. This is not to disparage dogmatism: for sure, it serves many basic purposes of mankind and makes life simple. However, the more prevalent change is, the greater the need for critical thinking, which enhances the process of learning.

I cannot teach anybody anything; I can only make them think.

—Socrates

systematically cultivated and cross-examined.⁴

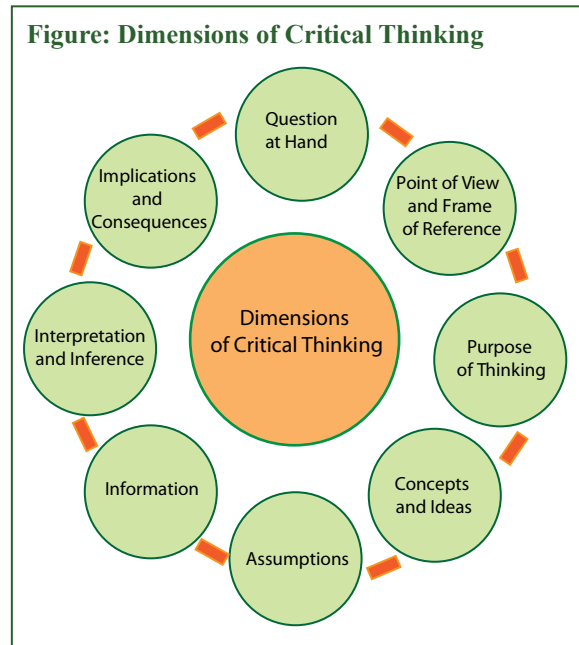
Critical thinking, by its very nature, demands recognition that all questioning stems from a point of view and occurs within a frame of reference; proceeds from some purpose—presumably, to answer a question or solve a problem; relies on concepts and ideas that rest in turn on assumptions; has an informational base that must be interpreted; and draws on basic inferences to make conclusions that have implications and consequences. To note, each dimension of reasoning is linked simultaneously with the other; problems of thinking in any of them will impact others and should be monitored.⁵ Hence, effective, full-spectrum questioning⁶ that connects from multiple perspectives must illuminate each element of thought so it may permeate the model.

... and Some Definitions

Critical thinking is discerning judgment. It is the art of analyzing and evaluating thinking with the intention of improving it. It is the purposeful, reflective, reasonable, and self-regulatory process of thinking out possible explanations for findings and outcomes and determining how compatible the explanations are with these, with attention to the evidential, conceptual, methodological, “criteriological,” and contextual considerations upon which judgment is based.

Else, it is an attitude of mind for analyzing and evaluating data and information gathered from observation, experience, reasoning, or communication with clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness.⁷ It rests on (i) a set of cognitive, reflective skills in interpretation, analysis, evaluation, inference, explanation, and self-regulation; and (ii) the ability and disposition to use these skills to guide behavior. According to Richard Paul and Linda Elder,⁸ a well-cultivated critical thinker

Figure: Dimensions of Critical Thinking



Source: Adapted from 2011. Foundation for Critical Thinking.
Available: www.criticalthinking.org/

⁴ Plato, the Greek skeptics, Thomas Aquinas, John Colet, Erasmus, Niccolò Machiavelli, Thomas More, and Francis Bacon, for example, built on Socratic questioning. Thomas Hobbes was a contemporary of Blaise Pascal and René Descartes. John Locke, Pierre Bayle, Isaac Newton, Montesquieu, Voltaire, Jean-Jacques Rousseau, Adam Smith, Immanuel Kant, Auguste Comte, John Stuart Mill, Charles Darwin, Karl Marx, Herbert Spencer, Charles Sanders Peirce, Sigmund Freud, William Graham Sumner, and John Dewey, among others, made significant contributions to the history of critical thought in many domains.

⁵ For example, interpretation and inference may change as new information becomes available. Changes in information may generate new questions, bear on the point of view and frame of reference, and require new concepts and ideas. Elsewhere, changes in assumptions may affect interpretation and inference.

⁶ A question is only as good as the answer it evokes, and questions thus contribute to success or failure across different contexts. Good questions query responses to “so what?”; elucidate meaning or conceptual vocabulary; investigate rationale, assumptions, and sources; endeavor to identify causes and effects or outcomes; and deliberate on appropriate action. Much as the problems they intend to address, questions are not always simple.

⁷ These are tough intellectual standards. They spring from, and call for the development of, intellectual traits (or virtues) of humility, autonomy, integrity, courage, perseverance, confidence in reasons, empathy, and fair-mindedness. See Richard Paul and Linda Elder. 2002. *Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life*. Financial Times Prentice Hall. By its very nature, learning is a tense endeavor that requires effort. Learners must recognize and resolve conflicts between observation and action and between experience and abstraction: in so doing, they must accommodate the external environment and assimilate experience. Put simply, learning involves thinking, perceiving, feeling, and behaving, all of them foundational elements of human adaptation. Conversely, hindrances to critical thinking and learning include basic human limitations, use of language, faulty logic or perception, and psychological or sociological pitfalls.

⁸ Richard Paul and Linda Elder. 2002. *Critical Thinking: Tools for Taking Charge of Your Professional and Personal Life*. Financial Times Prentice Hall.

- raises vital questions and problems, formulating them clearly and precisely;
- gathers and assesses relevant information, using abstract ideas to interpret it effectively;
- thinks open-mindedly within alternative systems of thought, recognizing and assessing as need be assumptions as well as implications and consequences from interpretations and inferences;
- comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards; and
- communicates effectively with others to figure out solutions to problems.

Read not to contradict and confute; nor to believe and take for granted; nor to find talk and discourse; but to weigh and consider.
—Francis Bacon

Reconciling Pascal and Descartes

Critical thinking underpins the scientific method: that is an organized, systematic, and cognitive process used by scientists in particular (but generally anyone wishing to answer a question or solve a problem) to search for cause-and-effect relationships. Its essential steps, each subject to peer review for possible mistakes, are to

- Define the question or problem;⁹
- Conduct background research, including data and information gathering and literature review;
- Form hypotheses (“educated guesses”);
- Test the hypotheses through experimentation;
- Analyze and interpret data and information to draw a conclusion; and
- Verify and re-verify the conclusion (and then communicate results).¹⁰

Men become civilized, not in proportion to their willingness to believe, but in their readiness to doubt.
—H. L. Mencken

Critical thinking, then, is analytical, judgmental, and selective. (When you are thinking critically, you are making choices.) But what of creative (or lateral) thinking? That is generative, nonjudgmental, and expansive. (Creative thinking has to do with change, especially when that involves escaping from a pattern. When you are thinking creatively,

you are generating ideas that are unique and effective.) Sadly, even if critical thinking and creative thinking are both crucial for solving problems and discovering new knowledge, they are often treated separately. (Critical thinking is typically thought of as a left-brain activity and creative thinking as a right-brain activity.)¹¹ Yet, they both involve “thinking.” (Some have spoken of critico-creative thinking to emphasize the positive, imaginative aspects of critical thinking; however, this ungainly expression has not caught on.)

Culturally, we need to discard the belief that critical thinking is sufficient: it is a quite valuable part of thinking but it is totally inadequate in the absence of the possibility systems that the generative, productive, creative, and design aspects of creative thinking throw up. For superior outcomes, since nature has equipped us with complementary ways of processing information, whole-brain thinking is needed. To this intent, thankfully, Howard Gardner’s notion of multiple intelligences refreshes and expands traditional views of human potential.¹²

⁹ Since definition sets the stage, the scientific method depends on characterizations of the subjects of investigation.

¹⁰ Retesting may be done by others. (Indeed, this is frequent in the case of scientists).

¹¹ The right hemisphere controls the left side of the body and the left brain controls its right side. Experiments have also shown that the two hemispheres are responsible for different manners of thinking: activities that stimulate the left brain use logic; those that stimulate the right brain use feeling.

¹² Howard Gardner has delineated five kinds of mental abilities that will be critical to success in a 21st century landscape of accelerating change. His disciplined, synthesizing, creating, respectful, and ethical minds are not presented as personality types but as ways of thinking available to anyone who invests the time and effort to cultivate them. Howard Gardner. 2008. *Five Minds for the Future*. Harvard Business Press.

Further Reading

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For further information

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