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Descartes' Four Rules and Critical Thinking

Abstract

Thinking critically is often regarded as the first step toward philosophizing. Throughout history, philosophical inquiry has been closely linked to the development of critical and logical thinking. This report examines critical and logical thinking through a philosophical lens, focusing on René Descartes' four rules from his seminal work *Discourse on the Method*. By exploring the relationship between these rules and the principles of critical thinking, we gain insight into how philosophical methods shape our approach to reasoning, decision-making, and problem solving.

Keywords: *philosophizing, critical thinking, logical thinking, decision-making, problem solving*

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Dekartın dörd qaydası və tənqidi düşüncə

Xülasə

Tənqidi düşüncə çox vaxt fəlsəfələşməyə doğru ilk addım kimi qəbul edilir. Tarix boyu fəlsəfi araşdırma tənqidi və məntiqi təfəkkürün inkişafı ilə sıx bağlı olub. Bu hesabatda tənqidi və məntiqi təfəkkür fəlsəfi prizmadan araşdırılır və Rene Dekartın əsas əsəri olan *Metod haqqında diskurs*dan dörd qaydasına diqqət yetirilir. Bu qaydalarla tənqidi düşüncə prinsipləri arasındakı əlaqəni araşdırmaqla, fəlsəfi metodların düşüncə, qərar qəbuletmə və problem həllinə yanaşmamızı necə formalaşdırdığına dair məlumat əldə edirik.

Açar sözlər: *fəlsəfə, tənqidi düşüncə, məntiqi düşüncə, qərar qəbuletmə, problem həll etmə*

Introduction

In today's world, critical thinking has become an essential skill in education, extending beyond the boundaries of the classroom to play a vital role in shaping both professional and personal futures. Educational institutions around the globe are working to modernize curricula that emphasize the development of learners' knowledge and competencies. These efforts are supported by innovative teaching strategies designed to foster intellectual independence.

Research

This article explores the concept of critical thinking and promotes a reflective approach to improving the learning process. It highlights the importance of developing students' critical awareness, enabling them to become more creative and adaptable to change. We will consider several key questions: What does critical thinking mean in education? Why is it important? What roles do the teacher and the learner play in implementing it in the classroom? How can it be effectively taught, and what are its educational applications? Finally, we will introduce some of the most effective digital tools that teachers can recommend to their learners.

1. Definitions of Critical Thinking

In his article “Philosophy and Critical Thinking”, Charles Verharen writes: “My first assumption is that critical thinking courses should stimulate students' thinking in the areas of language, formal logic, and philosophy of science in ways that will be useful to students even beyond the formal applications of the classroom.” (Verharen, 1997, p. 01). Verharen took the idea further when he posed the following question: Why do not we teach students how to philosophize, instead of focusing solely on simplified approaches to critical thinking?

The essence of philosophy lies in critical thinking. This is evident when we revisit the history of philosophy and consider one of its most influential figures: René Descartes. Descartes wrote what may be considered a foundational text in critical thinking, *The Discourse on the Method*. In it, he stated: “For it is not enough to have a good mind; the main thing is to apply it well.” (Descartes, 1998, p. 01). His point is that all people share the same mental faculties—reason is equally distributed—but what distinguishes individuals is how they use and apply their minds. For this reason, he advocated for a systematic method of mental discipline to guide reasoning. He strongly emphasized the need for clarity and precision in thought.

“For more than a decade, a number of educators and psychologists have looked at learning from a new perspective: rather than testing and labeling students by ability and achievement, they have sought ways to improve students' basic reasoning skills. This represents a significant shift away from the nature/nurture controversy: the assumption of these researchers and clinicians has been that critical thinking represents a set of skills that can improve with practice.” (Heiman & Slomianko, 1985, p. 10) They describe how modern views on critical thinking reject the old debate between innate abilities (nature) and environmental influences (nurture). Instead, researchers and clinicians now assume critical thinking consists of learnable skills that get better through deliberate practice.

2. Descartes on Humility, Discipline, and Multidisciplinary Thinking

First and foremost, there is an essential ethical principle in critical thinking: modesty and humility. Descartes emphasized this before introducing his methodological rules. He wrote: “For I have already reaped from it such harvest that, although I try, in judgments I make of myself, always to lean more on the side of diffidence than of presumption, and although, looking with a philosopher's eye at the various actions and enterprises of all men...” (Descartes, 1998, p. 02).

I would like to return to the concept I used earlier—what I refer to as Descartes' “multidisciplinary rules”—a term inspired by the full title of his book: *Discourse on the Method of Rightly Conducting One's Reason and Seeking Truth in the Sciences*. It is evident that we cannot discuss critical thinking without considering philosophy—particularly the contributions of René Descartes and Edmund Husserl.

3. Husserl and the Crisis of Science and Objectivism

In his final work, Edmund Husserl offers a profound diagnosis of the crisis facing both science and philosophy. By “crisis”, Husserl refers to the growing disconnection between scientific disciplines and their relevance to human life and everyday experience. This crisis, he argues, stems from the dominance of objectivism, which elevates mathematical physics as the ideal model of science.

More simply, Husserl suggests that science has unconsciously shifted away from critical thinking, leaning instead toward technical thinking—mechanical processes that solve problems without reflective judgment. In his view, true scientific meaning can only be restored through the application of critical thinking via the philosophical tool of epoché (suspension of judgment).

Phenomenology, the philosophical movement he founded, represents a comprehensive method for reconciling science and philosophy. Husserl famously described critical thinking as the soul of science. Without it, he warned, the scientific enterprise faces a profound existential crisis with potentially serious consequences for humanity.

The Crisis of European Sciences and Transcendental Phenomenology, despite its critical tone, is ultimately an optimistic work—a defense of universal critical rationalism in response to the rising tide of irrationalism in the modern age. It calls for a renewal of Enlightenment values and affirms the

enduring importance of philosophy in cultivating a self-aware, self-correcting scientific culture grounded in genuine human values (Moran, 2012, p. 14).

In the same context, Gaston Bachelard highlights that it is necessary to create a philosophy of epistemological detail, a differential scientific philosophy that would balance the integral philosophy of traditional philosophers. This differential philosophy would have the task of gauging the evolution of thought. In essence, the evolution of scientific thought would amount to a normalization, a conversion from a realist form to a rationalist one. This conversion, however, is never complete: not all notions are at the same stage of their metaphysical transformation. By meditating philosophically on each of them, one would discern more clearly the polemical nature of the adopted definition, all that it excludes, subtracts, or rejects. The dialectical conditions of a scientific definition, distinct from the common definition, would then be revealed more clearly; and, at the heart of the notional details, one would grasp what we will call the philosophy of the non (Bachelard, 1966, pp. 17–18).

In his book, *The Formation of the Scientific Mind: A Psychoanalysis of Objective Knowledge*, Gaston Bachelard argues that there are epistemological obstacles that must be constantly questioned and reconsidered in order to arrive at scientific knowledge; for example, deeply rooted everyday intuitions, sensory impressions, and unexamined metaphors often distort scientific reasoning and must be overcome through critical reflection and conceptual rupture.

The first observation, or more precisely the initial experience, always represents a major obstacle to the advancement of scientific culture. In reality, this observation unfolds in a profusion of images; it is vivid, tangible, spontaneous, and accessible. Simply describing it is enough to marvel at it and believe one understands it. We will begin our analysis by describing this obstacle, while demonstrating that there is a profound break, and not a simple continuity, between raw observation and rigorous experimentation (Bachelard, 1967, p. 23).

4. Descartes' Method of Doubt and the Meaning of "Cogito, ergo sum"

Descartes developed a method of critical thinking grounded in the principle of systematic doubt. He stressed the importance of basing thought on carefully examined and well-reasoned foundations. According to him, every component of thought should be questioned, doubted, and rigorously tested.

At the end of the first part of *Discourse on the Method*, Descartes wrote: "I learned not to believe anything too firmly of which I had been persuaded only by example and custom, and thus I gradually freed myself from many errors that can obscure our natural light and make us less capable of listening to reason." (Descartes, 1998, p. 6).

Through his famous proposition *cogito, ergo sum* ("I think, therefore I am"), René Descartes offered a profound insight into human nature as fundamentally reflective and rational. For Descartes, the capacity for thought defines human existence—it enables individuals to question, analyze, and evaluate the world around them.

The phrase "I think, therefore I am" is deeply tied to the practice of critical thinking. It emphasizes the role of self-awareness and reflection as essential foundations for acquiring knowledge. Likewise, critical thinking involves thoughtful analysis, skepticism toward assumptions, and the careful evaluation of evidence rather than passive acceptance of claims (Baan, 2025, p. 284).

Descartes' method of radical doubt—systematically questioning everything in search of what is absolutely certain—reflects the very core of critical thinking: skepticism, reflection, and reasoned judgment. By recognizing that the act of thinking itself affirms one's existence, Descartes underscores the role of conscious thought as the foundation of understanding and knowledge.

In essence, "I think, therefore I am" affirms the significance of the thinking self—the agent responsible for engaging in critical thinking processes such as evaluating arguments, identifying biases, and making reasoned decisions. This philosophical insight supports the development of critical thinking by promoting a reflective, inquisitive approach to knowledge and truth.

Descartes' Four Rules of Method

A. Rule One (Avoiding Prejudice and Seeking Clarity)

Let us examine Descartes' four rules of method one by one, while drawing comparisons with contemporary critical thinking theories.

The first rule states: “The first was never to accept anything as true that I did not plainly know to be such; that is to say, carefully to avoid hasty judgment and prejudice, and to include nothing more in my judgments than what presented itself to my mind so clearly and so distinctly that I had no occasion to call it in doubt” (Descartes, 1998, p. 11).

I would like to divide this rule into two parts. The first part—what I propose to call the “Don’t Accept Rule”—may sound a bit strong, but it serves as a useful concept for critical reflection. This principle emphasizes the importance of questioning anything that is not clearly understood or adequately proven. In other words, we should withhold acceptance of any claim that lacks clear evidence or logical justification.

Dr. Richard Paul and Dr. Linda Elder provide a more practical framework for this idea in their book *Critical Thinking: Concepts and Tools*, where they propose nine essential intellectual standards. Two of these are especially relevant to Descartes’ rule: clarity and logic.

Under clarity, they suggest asking:

- Could you elaborate further?
- Could you give me an example?
- Could you illustrate what you mean?

Under logic, questions include:

- Does all this make sense together?
- Does your first paragraph align with your last?
- Does what you say follow from the evidence? (Paul & Elder, 2014, p. 142).

These modern tools echo Descartes’ concern with the danger of accepting unclear or biased information and stress the necessity of disciplined, evidence-based reasoning.

One of Descartes’ most striking statements is: “Opinion is worthless as proof of truths that are at all difficult to discover, since it is much more likely that one man would have found them than a whole multitude of people.” (Descartes, 1998, p. 10).

Let us break this down:

1. Opinion is not proof — Descartes argues that the widespread acceptance of an idea does not make it true. Popular opinion, especially on complex matters, is not a substitute for logical reasoning or evidence.
2. Difficult truths require more than belief — Truths that are hard to uncover cannot be confirmed merely by agreement. In fact, they are more likely to be discovered by a single thinker applying disciplined reasoning.
3. Why one person over many? — According to Descartes, groups are prone to accepting ideas uncritically. An individual thinker, however, is more likely to engage in deep, critical reflection and avoid collective biases.

In short, Descartes warns against relying on majority opinion to establish truth. Instead, he promotes independent and rigorous thought as the path to genuine understanding.

The second part of the first rule in Descartes’ book is to avoid judgments and prejudices. Moreover, the war waged by philosophers against prejudices and biases in knowledge was fierce, as all philosophy was a methodological tool to combat relativism and subjectivity and achieve objectivity. Prejudices are negative opinions or attitudes formed based on insufficient or biased information. They hinder critical thinking and negatively affect the ability to make objective decisions. Critical thinking, on the other hand, is an analytical process aimed at objectively evaluating information and ideas and determining their validity and reliability.

Prejudices:

Definition:

Negative opinions or attitudes formed based on insufficient or biased information, often associated with specific groups or individuals.

Impact:

They can lead to discrimination and prejudice, hinder effective communication, and negatively impact social relationships.

Examples:

Prejudices related to race, gender, religion, or political affiliations.

Critical thinking for philosophy specialists, compared to its teaching in other disciplines, is more rigorous, subject to an integrated approach and multiple tools, as we observe in Husserl's phenomenology. "Husserl gives an illuminating description of how he means to proceed in phenomenological reflection: We will refrain from any traditional prejudgments, even the most universally obvious ones of traditional logic, which already have perhaps taken from Nature unnoticed elements of meaning" (Moran, 2012, p. 16).

Guy Smith and John Peloghitis published an article entitled "Approaching Cognitive Bias in Critical Thinking Instruction", in which they call on teachers to inculcate the idea that they are more prone to biases and need to work on their thinking, instead of believing they are protected from biases. By giving some examples and mentioning certain cases, they encourage teachers to accept this fact. "The results of three large studies by Wang and Jeon (2020), which utilized responses to hypothetical scenarios, showed that participants attribute more bias in others rather than themselves. However, this incongruity dissipates if they see themselves susceptible to biasing influences. This mindset will open students to the necessity of rethinking, accepting uncertainty, and addressing potential blind spots and biases in their thinking." (Smith & Peloghitis, 2024, p. 340).

Critical thinking is a complex mental process that requires awareness of biases and careful evaluation of information before accepting or rejecting it. It is a skill that can be developed through practice and training. By fostering critical thinking, learners can challenge their biases and seek diverse perspectives, which helps them make more informed decisions.

In short, cognitive biases are a major obstacle to teaching critical thinking. It is necessary to develop curricula and educational programs that address these biases, along with training teachers and students in deep and conscious critical thinking skills, to ensure the sustainability and effectiveness of this type of education.

Guy Smith and John Peloghitis make it more practical, suggesting that classroom activities and group strategies for addressing cognitive bias can be grouped into three main types. First, it is essential to foster a general awareness that our thinking is susceptible to bias. This initial stage, often called "unfreezing", encourages individuals to recognize the limitations of their intuition. Second, students should be educated about common cognitive biases and the ways these biases can interfere with rational decision-making. Finally, the third category consists of targeted strategies designed to directly address specific biases, aiming to minimize or eliminate their negative impact both in the classroom and in other contexts (Smith & Peloghitis, 2024, p. 340).

Questioning is the second communication strategy. According to Cormier (2006), the role of questioning is to encourage the respondent to rethink the problem from a different perspective, consider previously ignored aspects, refine their understanding, and draw their own conclusions. He also notes that effective questioning promotes the quality of reflection, innovation, and action, and facilitates the creation of knowledge within organizations. Lafortune, Martin, and Doudin (2004) distinguish between three types of questions: reflective, philosophical, and socio-constructivist questions. Reflective questions lead individuals to reflect on their practices, philosophical questions encourage reflection on one's own ideas, thoughts, and opinions as well as those of others, and socio-constructivist questions promote knowledge creation by generating socio-cognitive conflicts (Cormier, 2006, p. 94).

B. *Descartes' Rule Two — The Rule of Analysis (Divide to Understand)*

The second rule states: "The second, to divide each of the difficulties I would examine into as many parts as possible, and as was required, in order better to resolve them." (Descartes, 1998, p. 11)

This principle is often referred to as the Rule of Analysis. According to Descartes, when confronted with a complex problem, the thinker must break it down into as many smaller, manageable parts as necessary. This dissection allows for clearer understanding and more effective reasoning.

This rule is central to Descartes' philosophical and scientific method. Its purpose is to remove ambiguity from complicated issues and to simplify them so the mind can grasp them more precisely.

The more intricate the problem, the more essential it becomes to reduce it into basic components for detailed study.

In application, Descartes' method resembles that of mathematics and geometry: a complex problem is deconstructed into smaller parts, each analyzed in isolation to uncover causes and solutions.

In terms of importance, this approach is crucial to discovering truth. By focusing on simple, distinct components, one minimizes the chance of error and arrives at more reliable conclusions.

It is often argued that if a student does not consciously identify and articulate the method required to reach a conclusion from the outset, their thinking is likely to become disorganized or chaotic. In contrast, when a student works methodically—by outlining their thoughts, performing topical analysis, or applying a clear structure—their reasoning becomes more coherent and effective (Dewey, 1910, p. 99).

One of the nine intellectual standards emphasized in critical thinking is relevance. Relevance is essential for organizing thoughts effectively.

It can be guided by key questions such as:

- How does this relate to the problem?
- How does it bear on the question?
- How does it help us address the issue? (Paul & Elder, 2014, p. 142)

To be effective, logical, and goal-oriented in your thinking, it is important to clearly define your purpose. As Paul and Elder note: “As a developing critical thinker, you should get in the habit of explicitly stating the purposes you are trying to accomplish. You should strive to be clear about your purpose in every situation. If you fail to stick to your purpose, you are unlikely to achieve it.” (Paul & Elder, 2014, pp. 143–144)

Why the goal Matters in Critical Thinking:

Purpose guides your questions: Knowing your goal helps you ask relevant questions and seek appropriate information.

Purpose shapes your evaluation: When you know what you want to achieve, you can better judge which evidence or arguments are important.

Purpose leads to effective outcomes: Clear purpose increases the likelihood that your conclusions or decisions will be useful and meaningful.

Critical thinking helps a person gain a deeper understanding of himself. Critical thinking is a structured analytical process that enables an individual to objectively and logically evaluate their thoughts, beliefs, and values, leading to greater self-awareness and analyzing behavior and thought patterns. This self-understanding enhances a person's ability to develop themselves and achieve sustainable personal growth.

Through critical thinking, a person becomes able to:

Review and evaluate their thoughts and beliefs, free from personal and emotional biases, helping them discover their strengths and weaknesses.

Make informed and informed decisions based on a logical analysis of available evidence and information, thereby improving the quality of their personal and professional lives.

Develop intellectual independence and self-reliance in their thinking, rather than being influenced by external opinions or biases.

Continuous learning and self-development through the continuous search for knowledge and analysis of information, which enhances personal growth.

Enhance self-confidence and self-satisfaction resulting from sound decision-making and deeper self-understanding.

“There’s something else. We wish to make it clear that critical thinking, like our book as a whole, is about self-understanding. It’s part of that ancient project enshrined in the inscription on the temple at Delphi and in the liberal arts and sciences: “know thyself.” (Foresman et al., 2017, p. 05)

Therefore, critical thinking is not only a tool for analyzing information, but it is also an effective means for a person to better understand himself, which contributes to building a balanced personality

capable of facing life's challenges with confidence and awareness.

C. Descartes' Rule Three — The Rule of Order (From Simple to Complex)

The third rule, often referred to as the Rule of Order or Methodical Progression, appears in *Discourse on the Method* as follows:

“The third, to conduct my thoughts in an orderly fashion, by commencing with those objects that are simplest and easiest to know, in order to ascend little by little, as by degrees, to the knowledge of the most composite things, and by supposing an order even among those things that do not naturally precede one another.” (Descartes, 1998, p. 11). This rule emphasizes the importance of proceeding from the simple to the complex. After analyzing a problem into basic components (as prescribed in Rule Two), the thinker must reconstruct knowledge in an ordered and logical manner—this is the process of synthesis. This principle aligns closely with the philosophy of John Dewey, who viewed thinking as a methodical activity aimed at problem-solving. Dewey argued that thinking involves relating ideas, drawing connections, and arranging them logically. He wrote: “To think is to relate things to one another definitely, to ‘put two and two together,’ as we say... Caution, carefulness, thoroughness, definiteness, exactness, orderliness, and methodic arrangement are the traits by which we mark off the logical from what is random or purely academic.” (Dewey, 1910, p. 53). Dewey also emphasized that thinking is not merely the retrieval of information but an active, reflective process that includes defining problems, formulating hypotheses, testing ideas through experimentation, and arriving at generalizations. For Dewey, effective thinking requires the thoughtful guidance of natural curiosity toward productive outcomes.

D. Descartes' Rule Four — Enumeration and Complete Review (Perfect Induction)

The fourth rule is often referred to as the Rule of Complete Induction or Comprehensive Review. This rule emphasizes the need for thoroughly re-examining a problem, ensuring that no essential element has been overlooked.

Descartes states:

“And the last, everywhere to make enumerations so complete, and reviews so general, that I was assured of having omitted nothing.” (Descartes, 1998, p. 11). This final rule insists on patience and thoroughness before reaching a conclusion. Descartes warns against intellectual arrogance and impulsiveness.

He writes: “First, there are those who believing themselves more capable than they are, are unable to avoid being hasty in their judgments or to have enough patience to conduct all their thoughts in an orderly manner. As a result, if they have once taken the liberty of doubting the principles they had accepted and of straying from the common path, they could never keep to the path one must take in order to go in a more straightforward direction, and they would remain lost all their lives.” (Descartes, 1998, p. 09)

This rule calls for the thinker to conduct a full enumeration and a complete review of the reasoning process. Its goal is to guarantee certainty, minimize oversights, and verify that the entire reasoning process is logically sound and complete.

More specifically, this rule involves three key steps:

1. Comprehensive enumeration: The thinker must ensure that every element of the problem has been accounted for, leaving nothing out.
2. Thorough review: After enumeration, all findings and reasoning steps must be re-evaluated to confirm their accuracy and consistency.
3. Certainty and assurance: The ultimate goal of this rule is to achieve confidence that the conclusions drawn are valid and error-free.

John Dewey supports this idea in his reflections on the detection of error and the clinching of truth. He writes: “In the later stages, conscious formulation and review may be encouraged. Projection and reflection, going directly ahead and turning back in scrutiny, should alternate. Unconsciousness gives spontaneity and freshness; consciousness, conviction and control.” (Dewey, 1910, p. 185). Dewey, like Descartes, stresses the need for thoughtful revision. Only through continuous review can a thinker reach truth with certainty and avoid the dangers of superficial or impulsive judgment.

Conclusion

In conclusion, it is essential to cultivate the values and intellectual foundations on which modern philosophy was built—within our cultural and educational systems—in order to foster a critical mindset. Such a mindset is capable of reviewing, analyzing, questioning, and scrutinizing the ideas and ready-made knowledge it encounters.

These core values—rationality, causality, criticism, duty, and responsibility—must be actively transmitted through pedagogical and didactic practices in schools. The ultimate goal is to form active, thoughtful, and responsible citizens who can contribute meaningfully to society.

This vision cannot be realized unless critical thinking is granted a central place in educational curricula across all institutions. Only then can we hope to empower learners to navigate the complexities of modern life with awareness, autonomy, and integrity.

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