# COGNITIVE, SOCIAL AND PROCEDURAL VECTORS OF CRITICAL THINKING: FROM THEORY TO EDUCATIONAL IMPERATIVES

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**Summary**

This study investigates the primary conceptualizations of critical thinking, synthesizing contemporary insights from Ukrainian philosophical and specialized literature. The author introduces a tripartite framework to categorize critical thinking into cognitive, social, and procedural vectors. The analysis demonstrates that higher-order cognitive skills are vital not only for academic advancement but also for bolstering civic engagement and professional efficacy. Rather than framing critical thinking as a series of reactive, isolated decisions, this paper posits it as a disciplined adherence to cognitive protocols where individual actions align with broader behavioral rationality. Consequently, the ultimate objective shifts from a merely accurate reaction to the proactive design of independent behavioral strategies. This procedural approach empowers individuals to actively influence and direct societal outcomes. Crucially, within the context of modern information warfare, critical thinking serves as an indispensable defense mechanism safeguarding human consciousness against media manipulation. Ultimately, the author frames critical thinking as a mode of rational self-reflection that allows individuals to monitor their own cognitive processes, appreciate diverse perspectives, and execute autonomous, well-calibrated choices based on systematic situational assessments. This reality charges the philosophy of education with an urgent mandate: to systematically explore and construct the pedagogical environments necessary for the successful cultivation of critical thinking.

**Key words:** cognition, cognitivism, academic discourse, values, language, speech.

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## 1. Introduction

The critical need to cultivate advanced cognitive skills is driven by rapid technological and social acceleration, which demands that individuals swiftly adapt to fluid societal requirements. Modern professionals must continually evolve through self-directed knowledge acquisition, discovering innovative solutions to complex problems in highly volatile, non-standard environments. Relying on a singular, linear cognitive modality is no longer sufficient. Highly differentiated contemporary societies operate on a matrix of multiple social rationalities, each requiring distinct thinking techniques. Concurrently, academic discourse increasingly encourages novel

cognitive styles, innovative methodologies of proof, and highly individualized, author-centric approaches to solving theoretical and practical problems. Thus, the wholesale transformation of contemporary life justifies the systematic cultivation of complex, higher-order cognitive skill sets – chief among which are critical and creative thinking.

To systematically evaluate the mechanics of critical thinking, this study delineates three primary dimensions of analysis: **cognitive**, **social**, and **procedural**.

## 2. Theoretical Framework and Literature Review

The lineage of critical thinking as an intellectual discipline can be traced back to classical and modern philosophy, including the foundational works of Plato, Aristotle, Thomas Aquinas, John Stuart Mill, Bertrand Russell, and Karl Popper. However, as a distinct, formalized pedagogical term, "critical thinking" gained widespread traction in the 1970s.

In its modern iteration, the concept represents a major breakthrough of Western cognitive psychology and pedagogy, advanced by researchers such as J. Anderson, R. Sternberg, D. Halpern, J. Bruner, S. Miller, D. Nadler. The field has evolved significantly through contributions by international scholars like E. de Bono, M. Brown, M. Weinstein, S. Keeley, M. Lipman, R. Paul, and V. Ruggiero, who explored its systemic integration into global educational frameworks.

The investigation into the development of critical thinking represents a prominent trajectory within contemporary international and domestic pedagogical, psychological, and philosophical thought. The conceptual-theoretical foundation for defining "critical thinking" and substantiating the didactic conditions for its cultivation was established in the seminal 20th-century works of scholars such as J. Bruner, J. Dewey, D. Klooster, J. Piaget, and D. Halpern, among others. Concurrently, the epistemic and ontological dimensions of critical thinking constitute the subject of a distinct discourse within historical-philosophical analysis.

In the Ukrainian scholarly landscape, the multi-faceted nature of critical thinking has been extensively examined across several domains:

Creativity and Autonomy: V. Bibler, L. Hryhorovych, and P. Kravchuk analyzed the role of cognitive criticality in independent creative production.

Problem-Solving and Socialization: A. Bairamov, B. Zeigarnik, S. Korol, G. Lypkina, S. Rubinstein, and O. Tyahlo investigated how critical thinking facilitates problem-solving, young specialist self-actualization, and successful professional adaptation.

Pedagogical Integration: Higher education applications have been developed by T. Voropai, K. Kostiuchenko, and L. Terletska, while O. Pometun conceptualized critical thinking as an interactive educational technology. S. Terno further operationalized it as a specialized form of scientific thinking, designing cognitive task matrices for secondary education *(Terno, 2008)*.

R. Paul, A. Binker, D. Martin, and K. Adamson differentiated three primary groups of critical thinking indicators: affective, macro-cognitive, and micro-cognitive.

The affective indicators of critical thinking include:

- understanding egocentric and sociocentric motives;
- open-mindedness and impartiality of judgment;
- recognizing the interconnection between emotions and beliefs;
- intellectual perseverance in solving complex problems;
- suspension of premature judgment;
- confidence in reason;
- autonomy, courage, and intellectual integrity of thought.

The group of *macro-cognitive indicators* comprises:

- conceptual generalizing without a tendency toward oversimplification;
- comparing analogous situations and transferring knowledge to new contexts;
- broadening perspective (multi-faceted consideration of an issue, generating diverse arguments and hypotheses);
- clarity and precision in verbalizing assumptions, conclusions, and beliefs;
- clarity of exposition and deliberate word choice;
- developing evaluative criteria (clarity of foundational values and norms);
- assessing the credibility of information sources;
- depth of thought (prioritizing the most significant questions);
- analytical evaluation of human actions and behavioral strategies;
- critical reading (comprehending the essence and critically evaluating text);
- critical listening;
- establishing interdisciplinary connections;
- capacity for dialogical communication, mutual understanding, and evaluating a partner's beliefs;
- dialogical reflection (comparing and evaluating diverse perspectives, approaches, and hypotheses).

The group of *micro-cognitive indicators is* characterized by:

- comparing abstract concepts with reality;
- precision and criticality of statements;
- analysis and evaluation of statements, inferences, and predictions;
- the ability to isolate information relevant to the question under consideration;
- logical consistency of explanations, conclusions, and forecasts;
- evaluating the evidentiary basis of arguments;
- detecting logical contradictions in reasoning;
- analyzing the direct and indirect consequences of events or phenomena *(Horokhova, 2016).*

An analysis of international research demonstrates the absence of a consensus definition for "critical thinking," driven by the variability of theoretical approaches to its conceptual scope. Synthesizing the aforementioned definitions and insights, it can be concluded that the architecture of critical thinking primarily relies on the following competencies: evaluating events (statements, actions, facts, etc.); making conscious choices; constructing arguments; formulating relevant questions; differentiating facts from opinions; modeling innovative solutions; establishing criteria for analysis; identifying evidence to support assumptions; and constructing logical connections *(Horokhova, 2016).*

Within the framework of our study, the development of critical thinking is interpreted as the formation of a specific cognitive type within an individual, directed at the autonomous resolution of concrete cognitive or real-world problems. This process is realized through a comprehensive multi-faceted analysis based on poly-vector information sources, the identification and evaluation of alternative problem-solving trajectories, and the justified selection of an optimal strategy under conditions of continuous reflection and self-correction of one's mental activity.

Despite the diversity of conceptual interpretations, their core invariant reduces to the following premise: to think critically means to consciously evaluate, reason, and reflect – thereby demonstrating purposeful psychological, emotional, and cognitive agency directed at resolving a specific problem.

The core objective of critical thinking lies in the determination of objective truth. It operates as an autonomous cognitive process wherein information serves as a preliminary baseline rather than a terminal outcome. Critical thinking is initiated by formulating questions and identifying problems requiring resolution, consistently striving toward compelling argumentation. Furthermore, critical thinking is inherently social; every premise is verified, refined, and debated through interaction with others *(Terno, 2013:10).*

The exponential growth of global information volumes and the acceleration of scientific and technological progress have induced substantial structural shifts in societal relations. To satisfy these evolving societal demands, the primary objective of contemporary education must shift toward holistic personality development and the cultivation of an individual's intellectual and spiritual culture.

Consequently, high-quality education is virtually inconceivable without the integration of critical thinking. The cultivation of a critical mindset is therefore an urgent imperative currently facing social science education. There is a collective responsibility to establish appropriate educational conditions by introducing systemic modifications to curricular content, instructional methodologies, and learning frameworks *(Terno, 2013).* These transformations must be directed toward the internalization and development of critical thinking strategies. Structural educational reforms will ultimately reshape not only the role of instruction but the architecture of the educational system as a whole *(Terno, 2013: 10).*

The contemporary landscape demands highly qualified specialists whose efficacy significantly dictates the success of socio-economic and political transformations within the country. Such professionals must possess more than a fundamental knowledge base and communicative competence; they must demonstrate advanced intellectual development, distinct personal attributes, a progressive cognitive paradigm, and a critical style of thinking. Collectively, these requirements present the philosophy of education with a clear and urgent mandate: to investigate the optimal conditions for successfully cultivating critical thinking through educational instruments.

### 3. Methodological Dimensions of Critical Thinking. The Cognitive Vector

From a cognitive perspective, critical thinking entails the deployment of targeted strategies that maximize the probability of achieving a desired outcome. This modality is inherently controlled, autonomous, well-grounded, and goal-directed. It serves as the primary cognitive apparatus for problem-solving, generating inferences, calculating probabilistic estimates, and decision-making. Scholarly consensus accurately defines this as "a complex mental process that initiates with the acquisition of information and culminates in an informed decision" *(Hlazkova, 2008: 57).*

Critical thinking represents an active, multi-layered cognitive integration where information sources are continuously re-evaluated, synthesized, and reconstructed. Within this sphere, practical logic serves as the primary instrument for assessing validity.

**The Social Vector**. Cognitive processes do not occur in an intellectual vacuum. Mental activity possesses an inherently socio-historical character; it cannot exist outside the social matrix, independent of language, or detached from the historically accumulated knowledge structures of humanity *(Khalabuzar, 2008: 115).* The cognitive problems individuals attempt to solve are fundamentally generated by their immediate social conditions.

Consequently, analysis must account for an array of socio-political variables, ranging from personal behavioral motivation to the nature of the macro-political regime. It is widely

acknowledged that authoritarian and totalitarian systems systematically suppress intellectual criticality, whereas democratic environments actively foster its proliferation.

**The Procedural Vector and the Role of Language**. Crucially, human thought in any form is structurally impossible without linguistic mediation. Explicitly manifested through speech, language provides the material, verbal vessel that preserves and stabilizes thought – a primary evolutionary divergence between human and non-human psyches. A word does not merely serve as a static label for an object; it characterizes the object, functioning simultaneously as an act of speech and an act of thought *(Horokhova, 2016)*. An intellectual act represents a holistic unity of knowledge, empirical experience, cognitive operations, and personal attitude, because thinking is executed not merely by a brain, but by a living organism interacting with reality.

## 4. Discussion: Proactive Action vs. Automatic Cognition

A critical distinction must be made between systematic critical thinking and what Diane Halpern terms "automatic thinking" *(Halpern, 2003)*. Routine daily habits – such as waking up, dressing, or commuting – are goal-oriented but require minimal conscious evaluation or structural reflection. Similarly, unstructured mental states like daydreaming or sleep do not fall under the category of directed, critical cognition.

True critical thinking operates as a highly regulated adherence to cognitive procedures, where the value of any single action is subordinated to the overarching rationality of behavior.

The ultimate ideal of critical action is not merely an accurate reaction to a stimulus, but the proactive construction of original behavioral scenarios. The procedural framework of critical thinking must ensure that the individual does not simply adopt an initiative-taking posture, but plays a leading role in directing the trajectory of events.

To accurately evaluate how language underpins this procedural framework, mind and language must be viewed not through a passive "theory of reflection," but through the intrinsic laws of their functional operation. Thinking does not merely reflect external phenomena; it reconstructs hidden, systemic connections that the investigator uncovers independently. It is an active movement of ideas that uncovers the essence of things, yielding a conceptual thought rather than a passive sensory image *(Khalabuzar, 2008: 116)*.

Thus, knowledge is inherently dynamic rather than static. It cannot be passively transmitted from one mind to another. While we utilize existing knowledge structures as historical foundations, the acquisition of new concepts requires an active psychic process of individual construction, where the subject assigns meaning by correlating new data with an organizing cognitive schema *(Resnick, 1985: 130)*.

**Educational Imperatives in the Era of Information Warfare**.

Halpern accurately identifies critical thinking as an indispensable cognitive antidote to external thought control and ideological manipulation *(Halpern, 2003: 10)*. In the 21st century, the capacity for clear, rational evaluation has transitioned from an academic luxury to an existential necessity. For the first time in history, humanity possesses the technological capacity for total self-destruction; the economic, environmental, and geopolitical decisions made today will reverberate across generations *(Halpern, 2003: 5)*.

This urgency is amplified exponentially during periods of intense information warfare. In an environment dominated by weaponized disinformation, only advanced critical thinking can insulate individual and collective consciousness from the highly manipulative vectors of pervasive media ecosystems. It enables citizens to:

1. Identify deceptive propaganda and structural fallacies in argumentation.
2. Assess the epistemological reliability of conflicting information sources.
3. Deconstruct cognitive biases to make autonomous, rational choices.

From a pedagogical perspective, the educational task shifts from teaching *what* to think to teaching *how* to think – specifically, teaching students to "think about meaning" and engage in metacognition ("thinking about one's own thinking"). To master this capability, the pedagogical objective must be clearly defined: "To teach critical thinking means to correctly formulate inquiries, direct cognitive focus along valid trajectories, and empower learners to independently derive conclusions and synthesize alternative solutions" *(Fedchyniak, 2008: 32).*

Learning is truly developmental only when it systematically activates this higher-order mental processing. Consequently, modern educational systems must implement profound structural and methodological changes, modifying curricular content and instructional formats to embed explicit strategies for critical cognition *(Terno, 2013: 10).*

## 5. Conclusions

Modern educational philosophy faces a clear and pressing mandate to comprehensively study and establish the exact pedagogical conditions necessary for the successful cultivation of critical thinking. High-quality contemporary education is structurally inconceivable without a foundational commitment to cognitive criticality. To navigate complex socio-economic and political transformations, modern societies require highly qualified professionals who possess not only a deep repository of fundamental knowledge and communicative competence, but also an advanced architecture of intellectual development characterized by an analytical, self-reflective, and critical style of thinking.

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