

Cultivating Critical Thought in Academic Research Practices in the Age of AI

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Abstract

While the concept of "critical thinking" has a relatively recent genesis, dating back barely a century, its intellectual lineage can be traced to the philosophical traditions of Ancient Greece, embodying a commitment to rationality and rigorous inquiry (Scheuer, 2024). The pre-Socratic Milesian philosophers, particularly Thales, are often credited with pioneering the "critical method," laying foundational principles for analytical thought (Dörrenbächer & Michailova, 2019; Toh et al., 2025). John Dewey further developed the concept, proposing a five-phase model to enhance reasoning abilities and emphasizing the reflective and questioning attitude inherent in critical thought (Larson et al., 2024; Sajidin, 2025). This historical trajectory highlights a persistent intellectual endeavor to refine the processes of inquiry and evaluation, culminating in more formalized definitions such as the Delphi report's characterization of critical thinking as "self-regulatory judgment that gives reasoned consideration of evidence, contexts, conceptualizations, methods, and criteria" (Manning, 2024). This self-regulatory judgment is crucial for academics, enabling them to dissect, evaluate, and synthesize information effectively within their specialized domains (Chukwuere, 2024). This comprehensive understanding of critical thinking encompasses a broad spectrum of cognitive skills and affective dispositions, including the propensity to ask probing questions, maintain open-mindedness, and meticulously evaluate evidence (Heston, 2023). Within academic research, critical thinking manifests across several key domains, including the discernment of information, the formulation of robust methodologies, and the construction of evidence-based arguments (Li et al., 2025). Specifically, it facilitates the nuanced interpretation of complex datasets and the rigorous assessment of theoretical frameworks, thereby advancing scholarly discourse (Heydarnejad et al., 2021). Furthermore, critical thinking is not merely a cognitive skill but also a dispositional trait, involving a commitment to intellectual rigor and reflective skepticism in the face of complex problems (PS et al., 2023). This foundational understanding is crucial for navigating the complexities inherent in scientific inquiry, where researchers must critically appraise existing literature, design methodologically sound experiments, and interpret results within a broader theoretical context (Tsai, 2019). This comprehensive engagement with knowledge allows for the identification of gaps, inconsistencies, and novel avenues for investigation, thereby propelling intellectual advancement across disciplines. Moreover, critical thinking serves as an indispensable metacognitive process, integrating various skills and dispositions essential for distinguishing between competent and merely technical engagement with research (Halpern, 1989). This metacognitive ability, involving purposeful, reflective judgment, demonstrably enhances the generation of logical conclusions and effective problem-solving strategies (Dwyer et al., 2014). Specifically, critical thinking encompasses synthesis, evaluation, and judgment based on explicit criteria, ensuring that assessments are systematic and consistent rather than arbitrary (Zhai et al., 2024). Given its profound impact, cultivating critical thinking in higher education has become a paramount objective, recognized by education specialists as vital for both academic achievement and professional readiness (Mihail, 2023; Sarvary & Schmidt, 2026). The prevailing literature frequently characterizes critical thinking as a dual construct encompassing both skills and dispositions, although the former tends to receive more emphasis in contemporary academic discourse (Andreucci-Annunziata et al., 2023). While critical thinking skills refer to the cognitive tools used for analysis and problem-solving, dispositions denote the attitudes and intellectual habits that motivate their consistent application (PS et al., 2023). The interplay between these skills and dispositions is crucial, as the inclination to engage in critical thought is as vital as the ability to perform the cognitive tasks themselves (Patel et al., 2024). For instance, critical thinking entails analyzing arguments, inferring through inductive or deductive reasoning, evaluating information, and making judicious decisions or solving complex problems (Lai, 2011). This holistic view underscores that critical thinking is not merely a set of isolated cognitive abilities but rather a complex interplay of intellectual competencies and underlying attitudinal attributes, enabling individuals to navigate intricate academic and professional landscapes effectively (Bissonnette et al., 2021).