

**MINDFIRE PRESS ARTICLE**

**Critical Thinking**

by

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What does it mean to exercise critical thinking? Does it mean to be negative and adversarial? Does it mean to provide constructive criticism? Or does it mean something totally different? To explore the nature of critical thinking, we begin by examining the concept of left and right brain thinking.

### **Left and Right Brain Thinking**

Brain research suggests that the left and right sides of the brain have distinct and complementary functions. Simply put, the left brain is the seat of logic and, hence, analytical thinking, and the right brain is the seat of intuition and, hence, system thinking.

So, is critical thinking left-brained, analytical thinking, or is it right-brained, system thinking? Perhaps by examining the thinking of a few great scholars we can answer this important question.

Everyone knows that Einstein was one of the great minds of all time. Clearly, Einstein's theory of relativity qualifies him as a left-brained, analytical person.

Leonardo Da Vinci, as the painter of the Mona Lisa and The Last Supper, clearly qualifies as one of the great creative thinkers of all time, a truly right-brained, artistic, systemic person.

But, wait a minute you say. Wasn't Einstein also a concert-level violinist and Da Vinci also a brilliant inventor and the chief engineer of the Duke of Milan?

Apparently, the great thinkers were really both left and right brained; that is, whole-brained. When confronted with a complex problem, they first used their right brain to get the big picture, systemic view of it; then they used their left brain to break it into manageable subproblems which they analyzed for insight into the solution of the original problem. And so on and so forth.

As we have seen, the alternating use of the left and right sides of the brain, called whole-brain thinking, is the hallmark of great thinkers. So, if it is to embody the high level thinking exemplified by great minds, our concept of critical thinking must incorporate whole-brain thinking.

### Lower vs. Higher-order Thinking

To differentiate the work of students from scholars, academics use a framework called Bloom's Taxonomy. According to Benjamin Bloom, there are multiple levels of thinking. They follow a hierarchy from the lowest to the highest order or level:

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Students tend to focus on the lower level skills since the educational system at the levels below the doctorate tend to emphasize their use. For example, in the early grades you learned by memorizing certain facts, such as "Columbus sailed the ocean blue in 1492." By regurgitating these important facts on command, you demonstrated your knowledge.

As you progressed to the middle grades, teachers asked you to think at a higher level. For example, upon correctly stating in science class that the earth is round, not flat, a good teacher might have asked you a follow-up question about how you knew the earth was not flat. Being a good student, you might have answered that the sun rises and falls every day, which would not happen if the earth were flat. This would have demonstrated your comprehension of the basic concept.

At some point in your educational progression, a teacher undoubtedly asked you to illustrate still higher-order thinking, perhaps on a test, by applying what you knew and understood to the solution of a problem. For example, she/he might have said, "If the earth is round and rotates counter-clockwise on its axis, and it is noon time where we are in New York City, is it morning or afternoon in Los Angeles?"

Knowledge, comprehension, and application are important at any educational level, including the doctoral level. However, in addition to these lower-level skills, you will need to demonstrate the higher-order thinking implicit in analysis, synthesis, and evaluation in your doctoral work.

Continuing the illustration, imagine a college professor asking you to write a term paper analyzing the musical styles of several composers. Your paper would certainly have presented some basic, descriptive information on their styles (to demonstrate both your knowledge and comprehension), and an example or two of each style (as applications of their musical theories).

But, at this level, you would have had to demonstrate a still higher level of thinking. So, your paper would have included a substantive section in which you compared and contrasted the commonalities and differences, respectively, in the styles of the composers. This would have constituted the primary demonstration of your critical thinking about the composer's musical styles.

For your final exam in an MBA class on OB (Organizational Behavior), a professor might have upped the intellectual ante by asking you to synthesize into a coherent theory of human motivation the theories of Lewin, Maslow, McGregor, and one other humanistic psychologist of your choice.

Finally, for a major paper in your doctoral program, you might have to evaluate critically the ideas of four to six eminent human development theorists, such as Freud, Erikson, Jung, and Maslow. This assessment would require that you demonstrate all six levels of thinking, especially the higher-order ones, listed in Bloom's Taxonomy.

When faced with this assignment, an ordinary doctoral student would probably write a paper that described the works of the individual theorists in great detail and, in a short concluding section, compared their views on one of more issues representing the focus or theme of the paper.

A budding scholar on the other hand, would clearly identify a central, organizing theme for his or her essay and build the entire paper around this theme. Rather than focusing on the theorists ideas in isolation and tying them loosely together at the end, as the student would likely do, the scholar would use the ideas and arguments of the theorists to illustrate, illuminate, and inform various aspects of the central theme.

The difference between the scholarly essay and the typical student essay would be, to paraphrase Mark Twain, like the difference between lightning and the lightning bug.

So, what is critical thinking?

Is critical thinking whole-brain thinking? Or, is critical thinking higher-order thinking? In practice, it is both.

As a doctoral student, your work must reflect all levels of thinking, particularly the higher-order thinking skills of analysis, synthesis, and evaluation. In addition, your work should incorporate a whole-brain approach that uses right-brained, systemic thinking to support left-brained, analytical thinking, and vice-versa.

## Critical Thinking

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Now, as important as critical thinking is to success in doctoral work, it is not the only critical skill required of scholars. Others include the ability to search the literature effectively, read what you find from a scholarly perspective, and write in a way that other scholars expect and understand.

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If you enjoyed this article, be sure to share it with other doctoral students.

Finally, to learn more about these critical, higher-order thinking skills and other important aspects of doctoral study, go to [www.mindfirepress.com](http://www.mindfirepress.com) or [www.Amazon.com](http://www.Amazon.com) and order a copy of *Student to Scholar: The Guide for Doctoral Students* by Robert E. Levasseur, Ph.D., the book from which this excerpt on critical thinking came.

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