



ROBERT DIYANNI

CRITICAL AND CREATIVE THINKING

A BRIEF GUIDE FOR TEACHERS

WILEY Blackwell

Critical and Creative Thinking

A Brief Guide for Teachers

Robert DiYanni

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For Joan Weber and Carl Weber

*For my dear friends Dr. Joan Weber
and Dr. Carl Weber, who have consistently demonstrated
exemplary leadership in education and in medicine, with
generosity, grace, and compassion.*

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Preface

When we think about thinking, we often think first of “critical” thinking. The world at large values critical thinking highly—and for good reason. Critical thinking involves analysis and evaluation, interpretation and judgment. Critical thinking is essential for making sense of the world and for understanding ourselves.

To limit thinking, however, only to critical thinking is reductive, even dangerous. To supplement and complement critical thinking, we need “creative” thinking, the kind of imaginative thinking that leads to new ideas, to creativity and innovation. Creative thinking is also highly valued in the world at large. Creative thinking completes and fulfills critical thinking. Either without the other is inadequate. Whole-minded thinkers generate new ideas creatively and evaluate them critically.

Learning to think critically and creatively can make a difference in your personal and professional life. Developing your critical and creative capacities can increase your confidence, deepen your understanding, and improve your performance. Thinking well broadens your perception and enriches your intellectual and emotional well-being.

Not thinking well, on the other hand, reduces the range, depth, and intensity of your lived experience. Not thinking well limits your potential accomplishments. This book can help you overcome such limitations.

Combining critical and creative thinking, this book explains a set of approaches and offers a series of opportunities to think about a wide range of issues and topics. It includes both general guidelines and specific techniques to improve

your thinking and the thinking of your students. Drawing from and consolidating a wide range of sources, it summarizes and synthesizes key ideas and presents them for your consideration.

A few words about the book's structure. Part One introduces essential concepts for critical and creative thinking. Part Two provides opportunities to practice them. Part Three applies critical and creative thinking to decision-making and questions of ethics. Six interchapters identify essential strategies for developing higher order thinking. Each strategy is associated with a thinking habit of Leonardo da Vinci.

It is one thing to learn about the various ways of thinking that this book provides; it is another, however, to develop skill in using them. To benefit most from what the book offers, you should work through its varied applications. Select a few for your reflections in writing.

There is nothing more vital than developing your capacity to think well about complex issues and questions. This book is designed to help you do just that, while developing your critical and creative thinking powers. These thinking powers can make a difference in how you perceive yourself, how you understand others, and how you experience the world. And they can help you make a similar difference in the lives of your students.

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My final and most important acknowledgment of appreciation is to my wonderful wife, Mary Hammond DiYanni. Mary is a critical and creative thinker *par excellence*. I am fortunate beyond measure to have enjoyed her steadfast love and splendid companionship for more than four decades. My toughest critic, Mary has also been my most ardent supporter. I owe her not less than everything.

About the Website

Please visit the companion website to view additional content for this title at

www.wiley.com/go/diyanni/guidetocriticalcreativethinking

Available to Instructors Only:

- Detailed lessons, written by the author as well as other teachers, that make thinking visible and call upon students' critical and creative thinking faculties and targeted at middle school, high school, or first-year university students.

Part One

Introducing Critical and Creative Thinking

Based on logic and careful reasoning, critical thinking is purposeful thinking guided by reasoned evidence. It defines problems, identifies competing arguments, uses relevant data, raises key questions, and uses information effectively to make reasoned judgments. The word “critical” derives from the Greek work *kritikos*, which means “judge.” Critical thinking involves rationality and convergent thinking.

Critical thinking does not necessarily involve criticizing ideas (although sometimes, being “critical” in this way can be an aspect of thinking critically). Nor is critical thinking used only for serious subjects or important issues. You can think critically about what kind of popcorn to buy or what hat to wear, whether to marry or remain single, whether you should go to graduate school or move to a foreign country.

Characteristics of critical thinking include noticing perceptively and establishing careful connections; asking probing questions and making meaningful distinctions. Critical thinking involves analyzing, interpreting, and evaluating evidence; applying knowledge; thinking independently and interdependently.

Certain tendencies, or dispositions, are essential for critical thinking. Among them are open-mindedness, honesty, and flexibility; perseverance; reasonableness, diligence, and focus. Critical thinkers reconsider ideas and sometimes change their minds. They recognize the legitimacy of alternative views, embrace ambiguity and remain open to continued learning.

Essential critical thinking competencies include evaluation and self-direction. Evaluation through informed and sound judgments, and through considering values, is central to the process of critical thinking. Self-direction includes self-awareness and self-regulation—managing your thinking

and your motivation for thinking. Critical thinking also involves asking productive questions. Asking the right kinds of questions is as important as answering them. Essential significant questions include those shown in [Table 1.1](#).

Table 1.1 Essential critical thinking questions

| | |
|-----------------------------|------------------------|
| What do you know? | What have you assumed? |
| What questions can you ask? | What does it mean? |
| What is the evidence? | What are the criteria? |

Underlying these questions is the fundamental critical thinking question: “How do I know what I think I know?” And, “What evidence do I have for what I think I know?”

Critical thinkers constantly challenge their thinking and the thinking of others. They exhibit a stance of deliberate skepticism, refusing to accept assertions without evidence to support them. They also try to consider their own ideas from the perspective of others who might see things differently. The following questions, which have been adapted from Richard Paul's and Linda Elder's (2002) *Critical Thinking*, offer guidance in doing this.

Guiding questions for critical thinking

1. What are the purpose and goal of the thinking?
2. What question or problem is being addressed?
3. What is the point of view or perspective?
4. What claim or idea is being advanced, and why?
5. What facts, information, or data support the claim or idea?
6. What assumptions are being made, and which of those assumptions might be questioned or challenged?

7. What inferences are being made, and what conclusion is drawn from them?
8. What implications and consequences can be inferred?
9. What concept or theory guides the thinking?

Habits of Mind

Your intelligence is the sum of your habits of mind—how you use those mental habits to think and solve problems. This book is designed to improve your current productive habits of mind while helping you modify or eliminate bad thinking habits. The Institute for Habits of Mind identifies and recommends the following thinking habits: (1) applying past knowledge to new situations; (2) remaining open to continued learning; (3) posing questions and identifying problems; (4) taking intellectual risks; (5) developing and sustaining curiosity; (6) thinking independently and interdependently.

Applying past knowledge to new situations

Using what you already know, you make connections between prior knowledge and new situations. American philosopher John Dewey reminds us that we learn by reflecting on our experiences. Thomas Edison claimed that he never made mistakes, but rather kept learning what didn't work in the process of figuring out what might.

Remaining open to continued learning

You continue learning all your life, which involves identifying opportunities for continuous learning everywhere. Being “open” to learning opportunities includes being willing to consider other perspectives and ideas, to possibilities for intellectual growth and development wherever they can be found.

Posing questions and identifying problems

Asking productive questions and identifying problems are essential for quality thinking. Socrates asked probing questions, pushing those he questioned ever deeper into inquiry, often to the point of exasperation and an acknowledgment of their ignorance. Questions invite answers; considering answers to thoughtful questions helps you discover the limits of your knowledge.

Taking intellectual risks

Taking risks with your thinking, moving outside your comfort zone prods you to think in new and interesting ways. Taking risks involves the chance of failure; it involves being frustrated by uncertainty. Progress, however, depends upon taking chances. Being willing to fail, and even to embrace failure, is essential for invention and discovery.

Developing and sustaining intellectual curiosity

Curiosity is the motivation for all learning. Children are immensely curious about all sorts of things. Many people, unfortunately, lose that curiosity during their years of schooling. One of the greatest thinkers of all time, Leonardo da Vinci, considered curiosity fundamental to his life as an artist, scientist, and inventor. He repeatedly acknowledged curiosity as his most important habit of mind.

Thinking independently and interdependently

Although necessary, independent thinking is only part of the story; also necessary is collaborative thinking. The process is reciprocal: you link your thinking with the thinking of others. You feed off the ideas of others, who

then feed off yours. Both independent and interdependent thinking spur progress and spark innovation.

Why Intellectual Habits and Character Matter

To become truly useful, these habits of mind need to be actualized as things you do regularly. In making these kinds of thinking habitual, you develop what Ron Ritchhart (2004) has called “intellectual character,” a cohesive way of thinking that is distinctively your own. His notion of intellectual character includes habits of mind, along with patterns of thinking and general dispositions about thinking that reflect how you think. Developing an intellectual character requires building on positive thinking dispositions, such as persistence, patience, and perseverance. Your intellectual character defines you as an individual thinker; it reflects your particular way of engaging the world mindfully.

David Brooks (2014) echoes and extends these ideas with a set of “mental virtues” he believes are embedded in character, virtues necessary for quality higher-order thinking. Among these mental virtues are intellectual courage, which Brooks defines as the “willingness to hold unpopular views.” Firmness and autonomy require an ability to hold to your ideas in the face of opposition. They involve a balancing act between flaccidity and rigidity, and between respect for authority and tradition on one hand, and the ability to depart from those influences, on the other. Brooks adds generosity and humility to the mix, recognizing others' ideas and acknowledging the limits of your knowledge and understanding. Thinking well requires resisting vanity and laziness, pushing against the need for certainty, resisting the urge to avoid painful truths. In short, good critical thinking for Brooks is a “moral

enterprise,” one that requires “the ability to go against our lesser impulses for the sake of our higher ones.”

Enhancing your ability to think critically can have a pronounced effect on your behavior as well as on your attitude toward learning and the thinking of others. Taking intellectual risks can make you both a more daring thinker and a more interesting one. Being open to the possibility of failure can lead you to a more experimental and exploratory frame of mind, permitting you to try different options with the knowledge that some won't work out. Risk-taking demonstrates a kind of intellectual courage necessary for eventual creative breakthroughs.

Learning to think interdependently enriches your intellectual experience, with opportunities for you to bounce ideas off others and to share in the pleasure of figuring things out together. It also provides practice in the necessary skill of collaboration, which is critically important in today's workplace. Being open to others' ideas and perspectives and willing to change your mind helps to develop skills in negotiation and conflict management, while enhancing your reputation as a reasonable and flexible thinker.

Overcoming Obstacles to Thinking

To develop productive intellectual habits, you need to overcome various obstacles that can block your thinking. In *Conceptual Blockbusting*, James L. Adams (2001) discusses blocks to thought, including perceptual blocks, cultural blocks, intellectual blocks, emotional blocks, and polarizing blocks.

Perceptual blocks to thinking

Perceptual blocks inhibit your ability to make sense of what you are looking at. They interfere with what you can see. To overcome perceptual blocks you keep looking until you can make sense of what you are seeing.

In looking at Picasso's painting *Guernica*, for example, you notice distorted human figures. You can find *Guernica* on many Internet sites, including <http://www.pablopicasso.org/guernica.jsp>.

You see a horse with an open mouth, its tongue a spike, in what appears an agonized scream; you see an extended arm and a hand holding a light. You see distorted human arms and legs, hands and fingers and feet in contorted postures. You see a head thrown back with its mouth open, a person with arms extended upwards, and a hand clutching a sharp object.

Making sense begins with careful noticing. It involves relating the details you see, considering why they have been put together. It involves asking questions about what you observe. In the process you arrive at an understanding of the significance of what you are looking at.

Besides doing your own noticing, you can also ask colleagues or friends what they see and what sense they make of *Guernica*. You can also do some research into what Picasso attempted with this painting, and why he created it. Knowing something about the historical events that inspired Picasso to paint *Guernica* and learning something about the painting's varied contexts can deepen your understanding and enhance your appreciation.

Learning to see ably requires patience, effort, and practice. You prepare yourself to see; you learn how to look. One crucial element for improving your thinking, then, is to become more observant—to broaden and deepen your perception.

To notice the special features of Chartres cathedral, to appreciate the moves of basketball star LeBron James, or the skills of actors, such as Leonardo DiCaprio and Cate Blanchett, you have to know something about architecture, basketball, or acting, respectively. One pillar of observation is knowledge. The more you know about something, the better you see it, understand it, and appreciate it. You may take pride in your knowledge of architecture, basketball, movies and acting, a pride earned through a deepening of knowledge. That deepened knowledge enables you to see more and to see better than those who lack such knowledge. You can overcome perceptual blocks to thinking, then, in a variety of ways. Seeing more and seeing better, and knowing more are some productive perceptual blockbusting strategies.

Cultural blocks to thinking

Cultural blocks develop from ingrained thinking habits. Cultural blocks to thinking derive from ethnic, racial, national, and intellectual traditions, as well as from your gender and social class. Italians and Norwegians, Latinos and Native Americans, Japanese and Singaporeans, men and women, the wealthy and the poor, bankers and poets, have different life priorities largely because of their different experiences and their differing social and cultural, political, and economic backgrounds. Similarly, people of different religions are committed to varied ideas about the role of children or animals in society, or the degree of respect given the elderly, or to educators, for that matter. Your perspectives on issues, including your way of seeing the world, are influenced by such factors.

Cultural blocks inhibit thinking. Recognizing cultural blocks is the first step toward avoiding them as an impediment to thinking. Being aware of your cultural filters enables you to better understand why you see the world as

you do and why others may see it differently. It's a first step toward recognizing those other ways of seeing and acknowledging their legitimacy and value. This acknowledgment validates your own cultural background, perceptions, and filters, while also recognizing the legitimacy of other ways of seeing things, of other cultural perspectives.

Intellectual blocks to thinking

Intellectual blocks involve knowledge and its limitations. You may sometimes find yourself unable to solve a problem because you lack information or because the information you have is incomplete or incorrect. In buying a car, for example, you may not know the performance ratings of various models, or of their differing repair or safety records. You may have only information provided by dealers and their sales reps. If you lack a knowledge of cars, you will lack confidence when purchasing one.

On the other hand, you may know quite a bit about a particular subject yet lack the skill to express your ideas effectively. How often have you said to yourself, "I really knew what I wanted to say, but I just couldn't find the right words?" To break through an intellectual block, you need to acquire additional information or to deepen your understanding. You may have to think more deeply and more broadly about what you know—to consider other ways your knowledge can be applied or valued.

Emotional blocks to thinking

Emotional blocks to thought occur when feelings interfere with thinking. Emotional blocks include your fears and anxieties, with perhaps the biggest emotional block to thinking being the fear of being wrong. You may be concerned about how people perceive you, especially what

they might think if you are mistaken. Consequently, you may be reluctant to advance ideas you are unsure of. “What if I'm wrong?” you might wonder. “What if people think my comment is stupid?” Such emotional blocks can inhibit your ability to explore ideas; they impede your thinking. The solution is to allow yourself the luxury of being wrong, to forgive yourself for your mistakes. Mistakes are necessary for intellectual development. Not always knowing the answers is normal; error can lead to discovery, as the history of science and technology repeatedly demonstrates. The invention of Kevlar, for example, which is used in bullet-proof vests, was developed after a serendipitous lab experiment that didn't work out; the failed experiment led to the discovery of a fiber that was five times stronger than steel and many times lighter, one that has saved thousands of lives. Such knowledge can alleviate your fears about being wrong and overcome emotional blocks to thinking.

Another emotional block to thinking is an inability to tolerate confusion, uncertainty, and ambiguity. Periods of uncertainty are often necessary for breakthroughs in thinking. A toleration of chaos in thinking, however temporary, can be critical. In writing a report, for example, you shouldn't expect to decide on your idea, plan the organization, and write the ideal version in a single attempt. Exploring a subject, entertaining ideas, experimenting with different organizational structures, and writing some messy drafts is common, even for professional writers. The esteemed American writer E. B. White took six drafts and 25 hours of work before he was satisfied with a single paragraph that he published about the moon landing in *The New Yorker* magazine in 1969. Few successful thinkers and writers get things just right the first time, even masters of their craft like E. B. White.

Polarizing blocks to thinking

To polarize is to see things as opposed—“polar opposites” we call them, such as “us” and “them,” liberal and conservative, fashionable and unfashionable. Polarized thinking is “black and white” thinking, “either-or” thinking. Such thinking creates mutually exclusive categories that avoid compromise. Polarized categories, such as the following, inhibit thinking:

| | |
|-------------|--------------------|
| Yes/no | Friend/enemy |
| Win/lose | Diligent/lazy |
| Strong/weak | Intelligent/stupid |

Avoid limiting your thinking with these and other polarized categories; seek instead, the middle ground between them. Think, for example, about being “for” or “against” some plan, project, or idea. Consider how such a limited forced choice often misrepresents the complexity of your feelings. You might create a continuum that permits gradations between the opposing perspectives. You may want to say, in such a case, “Hold on. I am for this part of the plan, but I'm against that part.” You may favor curtailing health care costs, for example, but that does not necessarily mean that you support the President's latest plan for health care reform. Conversely, opposing the President's plan doesn't mean that you are against controlling the costs of health care. You may favor a particular economic stimulus package—just not the one that either Barack Obama or his opposition favors. Perhaps you support elements of each of their plans, but don't support either totally. “Yes but” and “No but” provide a structure for avoiding black-and-white, all-or-nothing polarized thinking.

Asking “to what extent” or “to what degree” is more productive than seeing a situation as “all or nothing.” To avoid “black and white,” “either-or” thinking, ask yourself the following question: “To what extent” is an idea

acceptable, a book interesting, a film entertaining or provocative? Considering degree or extent pushes you to make distinctions, to explore and consider possibilities and shades of difference. It encourages listening to others' views and perspectives, thinking interdependently, and ultimately developing better critical thinking habits of mind (see [Table 1.2](#)).

Table 1.2 How to overcome obstacles to thinking

| <i>Obstacles to thinking</i> | <i>Ways to overcome obstacles</i> |
|-------------------------------------|------------------------------------------|
| Perceptual blocks | Practice observing and noticing. |
| Cultural blocks | Become aware of cultural perspectives. |
| Intellectual blocks | Study. Review. Research. |
| Emotional blocks | Conquer fear of mistakes. |
| Polarizing blocks | Identify the middle ground. |

A Model for Critical Thinking

In *Theory of Knowledge*, Richard van de Lagemaat (2006) presents a cyclical model for critical thinking: Question—Clarify—Support—Evaluate—Reflect. The model is cyclical, such that after the final stage reflection, the cycle begins again. According to this model, you begin with what you know—or think you know. And then you cycle through the following actions:

- ***You ask questions:*** What questions can you ask about this knowledge?
- ***You seek clarification:*** What does this knowledge mean for you?