

INTRODUCTION

WHEN ST. PAUL was traveling on the road to Damascus, he experienced an epiphany. It may have been divine inspiration, or perhaps just inspiration. Whatever it was, it caused him to change the course of his life profoundly. When I was thinking about education policy problems and opportunities a few years ago, I had an epiphany. It didn't lead me to unsaddle my mule, quit my job, give up my worldly goods, or do anything so dramatic. But it did convince me to switch research topics, to focus on something I had taken for granted for many years and wanted to understand better. That subject was critical thinking.

Much of my research in recent years has focused on early childhood education and its outcomes. Like other scholars, I have measured educational outcomes by using standardized tests. Although these tests have some predictive validity, they seldom tap the cognitive skills that I personally value. Standardized test scores from kindergarten or third grade can predict later test scores but not necessarily college readiness or career readiness or civic readiness. These are three goals that I really care about, and I worry that two of them (career readiness and civic readiness) don't get the attention they deserve from teachers, administrators, or public officials. My concern about college readiness is a bit different: that all children may not be adequately prepared for a goal that is closely identified with the American dream.

I also worry that many education reforms, including standardized testing requirements, performance measures for schools, lower student-teacher ratios, merit pay for teachers, school vouchers, and charter schools, distract us from the central importance of classroom teaching. The Common Core, which does focus on course content and pedagogy, is a notable exception, but it has, unfortunately, become a lightning

rod for partisan criticism. My epiphany, on my road to Damascus, was to see critical thinking, when defined broadly and flexibly, as a promising pathway to college readiness, career readiness, and civic readiness. Critical thinking is the missing link between many of our most vexing societal problems and a brighter future.

What exactly is critical thinking? It is different from rote memorization, the mastery of facts without understanding their significance. It is different from what psychologists call “motivated reasoning,” or biased thinking, which prefers passion to truth seeking.¹ It is different from what Daniel Kahneman calls System 1 thinking, which is quick, intuitive, and often productive but not well suited for answering really difficult questions.²

I argue in chapters 1 and 2 that critical thinking is an open-minded inquiry that seeks relevant evidence to analyze a question or a hypothesis. Some of the hallmarks of critical thinking are a willingness to challenge the conventional wisdom, an inclination to reconsider your own cherished beliefs, a relentless search for good evidence, an ability to draw appropriate inferences from good evidence, respect for competing points of view, and persistence when answers to important questions seem elusive. I distinguish between critical thinking and other valuable forms of thinking, such as creative thinking and problem solving. I argue that some of the best thinking on the planet is “blended thinking,” which straddles these three categories. Think of it as critical thinking on steroids.

Why should we care about critical thinking? After all, there is no shortage of education issues, social issues, environmental issues, fiscal issues, and national security issues to worry about. Isn’t critical thinking a bit abstract, a bit esoteric? Wouldn’t it be better to focus on a more concrete, more urgent problem?

One reason to focus on critical thinking is that it is a potential cure for some of the biggest problems we face as a nation: *education deficits* that afflict many members of our society and make it difficult for them to share in the American dream; *employment deficits* that make it hard for many high school graduates and college graduates to find gainful, satisfying employment; and a *surplus of partisanship* that threatens to tear our society apart at the seams because we lack respect for our fellow citizens who have different points of view.

Education Deficits. In recent years, we have become obsessed with third-grade reading and math skills, as measured by standardized test scores. Disappointing test score results and persistent gaps between middle-class and disadvantaged students and between white students and students of color are legitimate concerns. Lackluster performances by US students on international tests are also worrisome.³ But the more fundamental problem is that our students often learn enough to pass tests, in specific courses and in standardized testing marathons, without deeply engaging or truly mastering the subject matter. That is the real crisis in American education—that students can recall a mathematical formula without knowing when and how to apply it, that students can memorize key biological terms without understanding how living organisms actually work, that students can recall key events and personalities in history without recognizing the social movements and trends that were driving these transformations. Critical thinking can help, a lot, with these kinds of education deficits because it forces students to ask good questions, avoid glib answers, look for strong evidence, discard weak evidence, articulate a point of view, respond to feedback, and reconsider their working hypotheses. These are the kinds of intellectual skills that college admissions committees look for and the kinds of intellectual skills that will help our students excel. Incidentally, this is also our comparative advantage in education, internationally. As an exceptionally free society, we are unusually well situated to nurture and cultivate critical-thinking skills that require open inquiry to take root.

Employment Deficits. Although we managed to weather the storm when the Great Recession threatened to become a full-scale depression in 2008, our economic productivity has declined, and many Americans remain unemployed or underemployed. The technological revolution has helped create some wonderful high-skill jobs for a fraction of the workforce, but middle-skill jobs have nosedived, and low-skill jobs continue to be low-pay jobs as well.⁴ The middle class has taken a hit, and our more disadvantaged citizens and families continue to suffer. Employers are frequently asked what the underlying problem is, and they consistently assert that our schools are not producing individuals who possess critical-thinking skills, communications skills,

and collaborative skills.⁵ When employers complain about a dearth of critical-thinking skills, it is unlikely that they are referring to high school graduates or college graduates who cannot decode a literary or historical text. Rather, they probably mean that we need to teach students how to solve complex problems, how to adapt to new situations, and how to improvise. This is very different from the kinds of critical-thinking skills we emphasize in US classrooms today because we don't really give the goal of career readiness the attention it deserves. Critical thinking can help us solve many of our economic problems, but only if critical-thinking instruction in K-12 classrooms encompasses the kinds of skills that employers value and that employees are likely to need in the workforce.

A Surplus of Partisanship. It is difficult to observe American society today without noticing a rise in partisanship, a decline in civility, a crowding out of moderate points of view, and a splintering of our mass media environments. These trends have infected our body politic like a poison, facilitating "motivated reasoning," or biased thinking. We all have our biases, of course, but motivated reasoning makes it difficult to recognize or escape them. Fortunately, there is a cure. A massive increase in critical thinking could help us become more thoughtful media consumers, more nuanced thinkers, more persuasive debaters, and better citizens. It could help us forge a truly deliberative democracy. It could help us choose our political leaders and our public policies more wisely. But isn't critical thinking part of the problem? Aren't we too critical of one another, too vicious in our rhetorical attacks, and too ready to dismiss our own critics? Yes, some of that is true. But critical thinking is not just recognizing the weaknesses of other people's arguments; it is recognizing the weaknesses in our own arguments, assumptions, and beliefs. We need to apply the same tough standards when appraising our own ideas that we do when appraising the ideas of others. That broader conception of critical thinking is the subject of this book.

For critical thinking to help solve these big problems, it must be explicitly linked to three goals: college readiness, career readiness, and civic readiness. These goals are complementary but not interchangeable. It would be a mistake to focus on only one of them (e.g., college

readiness), and yet that is roughly what we have done. In practice, critical thinking is defined so narrowly that it is often viewed as the special province of high school English and history teachers, who use Socratic seminars and other devices to get their students to dissect and interpret texts with sophistication, in the hope that they will get into a good college. This is a worthy goal, and high school English and history teachers, to their credit, have a greater appreciation for critical thinking than many other teachers do. There is much that we can learn from them and their teaching methods. But critical thinking is not just a means to college readiness, and analyzing texts is not the only way to demonstrate critical thinking. Also, if we wait until students are juniors or seniors in high school to promote critical-thinking skills, then we have waited too long.

In short, we need to embrace critical thinking as a versatile analytical tool that can enhance what we know about many subjects and elevate our discussions about many subjects to a higher level. Critical-thinking instruction is not just another item on the laundry list of tasks we assign to teachers. It is best viewed not as a burden but as an opportunity. In practice, critical thinking can be liberating, for students and teachers alike, because it invites more reflection and more thoughtful deliberation than one would otherwise see in the classroom.

In conducting research for this book, I took three complementary approaches. First, I immersed myself in the literature of several different disciplines, including psychology, philosophy, economics, political science, and neuroscience. At times, this was a bracing experience, like taking a plunge into an ice-cold river. But when hunting for ducks, one should go where the ducks are. And the literature on critical thinking is scattered across multiple disciplines. Second, I developed conceptual scaffolding to illuminate the relationship between critical thinking and other useful forms of thinking and to explain the form that critical thinking takes when it is linked to different goals (college readiness, career readiness, civic readiness). Third, I visited a total of twenty schools in an effort to better understand what critical-thinking instruction looks like in different classrooms and how critical-thinking instruction can be brought to classrooms with very different demographic characteristics (see Appendix). These schools

were, for the most part, located in parts of the country that I know very well—Pittsburgh, Pennsylvania, where I grew up; Arlington, Virginia, where I live; and Tulsa, Oklahoma, where I have done a good deal of education research. By visiting schools where I had relatively good access but which differed in their demographics, I hoped to shine a light on the many challenges and opportunities that teachers experience when they try to develop their students' critical-thinking skills.

In this book, I place a spotlight on critical thinking in an effort to persuade public officials and teachers to make it a high priority, to use it in multiple classrooms, to link it to multiple goals, and to introduce it early, beginning in preschool. In chapter 1, I document growing interest in critical thinking and try to explain this trend. In chapter 2, I distinguish between critical thinking and two other valuable forms of thinking—creative thinking and problem solving. When combined with critical thinking, creative thinking and problem solving can produce excellent results, including scientific discoveries, enduring systems of government, and dazzling new forms of entertainment. In chapter 3, I extract lessons about critical thinking from the growing literature on neuroscience. What does brain research tell us about the origins of critical thinking, the location of critical thinking, and how to teach critical thinking?

My central arguments can be found in chapters 4 through 6. In chapter 4, I confirm a strong connection between critical thinking and college readiness. In many ways, this is where we have made the most progress, thanks in large part to some talented, dedicated teachers. However, not all students have shared in this success. In chapter 5, I identify missed opportunities to connect critical thinking to career readiness. A key point here is that the kinds of critical-thinking skills that promote career readiness have been neglected, with unfortunate economic consequences, especially for disadvantaged students. In chapter 6, I document a civic readiness gap that seems to be worsening as we become more polarized politically. I distinguish, as others have, between participatory democracy and deliberative democracy, and I show how critical-thinking instruction can promote the latter if we choose to do so.

Throughout the book, I use vignettes from classrooms I have visited, in northeastern Oklahoma, southwestern Pennsylvania, and

northern Virginia, to illustrate some exemplary efforts to promote different forms of critical thinking. In chapter 7, I draw upon these classroom visits to illuminate some promising innovations in Science, Technology, Engineering, and Math (STEM) education that combine critical thinking, creative thinking, and problem solving in productive and sometimes exciting ways. Finally, in chapter 8, I offer some practical suggestions that could help us achieve the goals of college readiness, career readiness, and civic readiness.

Before we begin our journey, I would like to state clearly what should become evident in the pages that follow, which is that I have enormous respect and affection for teachers. Like most adults, I have benefited profoundly from some outstanding teachers, who have equipped me with valuable skills, challenged my preconceptions, and pointed me in new directions. I remember a piano teacher, Mrs. McDowell, who taught me well enough that I could perform for a live audience without dissolving into a bundle of nerves—great preparation for my eventual career as a professor. I remember a high school teacher, Bruno Scuglia, who asked a question that seemed surprisingly easy at first but that proved to be deceptively hard: who is the most powerful person in the city of Pittsburgh? I remember a college professor, Samuel P. Hays, who turned my world upside down by portraying history as a bottom-up rather than a top-down phenomenon. I remember a graduate school professor, Duncan MacRae, who inspired me by shifting gears midcareer to focus on big, important questions, even though they took him outside the comfort zone of his own immediate discipline. I should also tip my hat to an elementary school principal, Sister Alberta, who allowed me and my friends to stage a production of a Shakespearean play that was astonishingly bad but also astonishingly rewarding for those of us who participated.

Throughout this book, I pay homage to many outstanding teachers who work a special kind of magic in the classroom. They are the tip of a very large iceberg. Many men and women have devoted their lives to educating the next generation and have figured out how to stimulate, how to probe, how to challenge, how to provoke, how to broaden horizons, how to introduce new ideas, and how to get students to think for themselves. Many teachers have demonstrated how much they care by working long hours and by assisting students

after hours with extracurricular activities, with homework, with the ups and downs of life, and with their dreams for the future. When I make suggestions about how teachers might change their practices and their priorities, I hope it will be understood that I do so with the same constructive intent that motivated so many teachers to help me move in new directions.

I also want to emphasize that this is not just a task for teachers. If critical thinking is to occupy center stage in American education, then all of us must become involved. That includes elected officials, school administrators, teachers, business leaders, community leaders, journalists, and parents. All of us need to become critical thinkers—and advocates for critical thinking—if our educational, economic, and civic outcomes are to improve.