

The Global Achievement Gap

Why Even Our Best Schools
Don't Teach the New Survival Skills
Our Children Need—
and What We Can Do About It

TONY WAGNER



A Member of the Perseus Books Group
New York

Preface

AFTER HAVING SPENT a decade as a full-time high school English and social studies teacher, two years as a school principal, and six years working in the nonprofit world, I returned to Harvard in 1988 to pursue a doctorate in education. For my research, I spent more than a year observing classes and adult meetings in three very different high schools—one private and two public. All three were involved in some kind of change process. I was surprised to learn that the teachers in the two public schools were being told to try new things, such as interdisciplinary studies, team teaching, and cooperative learning, without having any understanding as to why—except that this was what they'd been asked to do by their well-meaning superintendent. As a result, many of their efforts were half-hearted at best. They knew, from years of experience, that the new reform was unlikely to be sustained—that in a few years, there would be another superintendent with a new initiative that would take the place of the current one. And indeed this was the case, as I discovered when I re-studied the same schools ten years later. Reform Du Jour is “business as usual” in most of our schools.

In the sixteen years since I completed my degree, I have been a university professor with responsibilities for teacher training, the president of a nonprofit organization focused on creating school-community partnerships for school improvement, and, for the last eight years, co-director of the Change Leadership Group, a small outfit at Harvard that works to understand what is effective change leadership in education and to support educators undertaking this important work. I have also been an education consultant for more than twenty years and served as senior advisor to the education program of the Bill & Melinda Gates Foundation, where I counseled on grants, strategies, and the challenges of what I call “public engagement”—ways to involve teachers, parents, and community members in discussions of how schools need to change. I've provided professional development for the foundation's program officers and grantees as well. Whatever the formal job description, my passion has remained the same: to help schools and districts improve learning, teaching, and leadership; to better understand the obstacles to change and the most effective strategies for overcoming them; and to share what I'm learning with others through speaking and writing.

I've spent time in schools and classrooms nearly every month for the past twenty years—schools in the United States and in several other countries—and I have learned a great deal about what works and what doesn't when it comes to leading improvement efforts. One of my biggest concerns is that most high school educators do not feel a real sense of urgency for change—perhaps because their work isolates them from the larger world of rapid change and they've lived through too many failed education fads. The result is that course curricula and teaching practices have remained pretty much the same for fifty years or more. Except for increased pressures to get kids to pass the new state tests, “Why change?” remains as unanswered a question for most educators today as it had been when I was doing my doctoral research. In fact, about the only thing that's different is the overwhelming majority of teachers—70 percent, according to the most recent Public Agenda Foundation poll—who think that there is too much testing in schools and that the No Child Left Behind (NCLB) legislation is doing much more harm than good.¹

Business leaders I talk to are more and more frustrated with our nation's public schools and the people who work in them. Some of them pushed hard for passage of NCLB and new state education laws, in the belief that these efforts would make public education more accountable; but they have seen little or no improvement in this area. Nor have they seen any evidence that students are leaving schools better prepared for the workplace. Many people think the teachers' unions and tenure are to blame because they protect ineffective teachers. Others advocate for more charter schools or vouchers, arguing that the forces of free-market competition are needed to pressure public schools to improve. Based on my review of the research to date, there's no solid evidence to suggest that either strategy significantly improves education outcomes, but business leaders seem determined to find something, anything, to shake things up—whatever it takes to get better results.

Meanwhile, most of us who are parents often don't follow the new education reform laws and don't have many opportunities to talk to either educators or business leaders about education issues. It's all we can do to manage our—and our children's—increasingly frenetic lives. Many of us have a great deal of anxiety about our kids' futures in a world that we see as much more competitive than the one we grew up in. And we are always upset when our child is assigned a teacher whom we consider mediocre—which happens much more often than we think it should. But other than

complaining to the principal about our children's teacher, most of us do not know how things ought to be different in schools more generally. Increasingly, though, many of us worry that there's too much testing in schools now—and too many classes that merely “teach to the tests”—where the focus is more on practice tests and test-taking strategies than on learning rich and challenging content.

Schools—especially high schools—aren't changing, then, in part because there is no consensus about what types of changes are needed or might work—or even whether there's a need for change at all. Business leaders (who, many are surprised to hear, have been the primary advocates for education reform), educators, and parents rarely talk to one another and so share little or no common ground. As in the well-known Indian fable, each group is blindfolded, touching just a part of the truth. For some time I've wanted to write a book that would contribute to a dialogue among these three groups about what we want our high school graduates to know and be able to do.

My interest in this problem became more pressing as I began to observe, with a growing sense of alarm, the accelerating pace of change in the twenty-first century and the ways in which this change was leaving our schools and our children further and further behind. Computers and the Internet were becoming essential tools in every workplace—but, from what I saw in schools, students rarely used technology as a part of their learning in classrooms. Students and teachers also continued to learn and work in isolation—whereas the rest of the work world had been organized into teams for decades.

Early in 2006, I read Thomas Friedman's *The World Is Flat*. He makes the case that *any job—blue or white collar—that can be broken down into a routine and transformed into bits and bytes can now be exported to other countries where there is a rapidly increasing number of highly educated “knowledge workers” who will work for a small fraction of the salary of a comparable American worker*. Reading this book deepened my understanding of the profound implications these sudden technological and economic transformations have for our economy and for our children's future. Friedman was talking not just about today's manufacturing jobs—most of which have already disappeared from this country. He was talking about professional jobs for engineers, architects, software code writers, technical support specialists, customer service representatives,

accountants, and the like. All of these jobs and many more rely mainly on skilled use of data and other kinds of information that can now be sent or received and processed nearly instantly almost anywhere in the world.

I thought about some recent phone calls I'd made. I'd talked to Dell's technical support several times, because of a computer problem, as well as to AT&T's customer service representatives about a billing issue, and then there was my call to the Quicken software support line. I asked one young man where he was speaking from, and he told me Bangalore. Another woman was in the Philippines. I suddenly realized that, for the last several years, almost all of my various phone calls to customer service or technical support numbers had been answered by someone who was not based in the United States. I thought about my son's job in a technical support unit for a city police department. Could his job be offshored as well?

I began to understand that more and more countries are graduating increasing numbers of young people who not only have basic computational and analytic skills but also are hungry for the middle-class lifestyle we have promoted through media and advertising around the world. In short, our young people are now in direct competition with youth from developing countries for many of what traditionally have been considered our "good middle-class white-collar" jobs. While some of our students are learning skills that enable them to interpret and manipulate information and data, the sheer numbers of students who are learning these skills in other countries and the fact that they will work for much less put our students at an extreme competitive disadvantage. What will American students need to know in order to compete successfully for these jobs? What are the skills that matter most in the world of work today? What will it take for young Americans to get and to keep a "good" job in the coming decades?

Meanwhile, news headlines nearly every day focus on the mounting chaos and deaths in Iraq as well as on new evidence of global warming. Like many of us, I've felt a growing sense of dread—not just about our safety since 9/11 but also about our diminished stature in the world and the looming environmental crisis. But in this context, too, the gap between the "real world" and the world of school is greater than ever. These issues were never discussed in any of the classrooms I observed. Some teachers I talked to wanted to have such conversations with their students, but they felt obligated to spend all available class time covering the content needed to ensure that the students would pass various standardized tests. Others were

simply afraid to talk about controversial issues for fear that a parent might complain.

It's not just discussions of current events that make most educators uneasy. They are equally impatient with any talk about the need to focus more on teaching students workplace skills. Many believe that churning out better workers for the corporate world is nothing more than "vocational education" and likely means turning kids into little automatons who know only how to follow orders. Is there any truth to this? Specifically, is there a conflict between preparing students for the world of work and teaching them about their roles as citizens? While educators assume that they are readying students for citizenship as a matter of course, I confess that I'm skeptical about the idea that high school graduates will automatically be better citizens for merely having taken the usual required classes. Teaching kids the history of the Electoral College doesn't prepare them to be more thoughtful voters—or even to want to vote at all. What, then, does it mean in today's world to be an active and informed citizen, and how does a democratic society best educate for citizenship?

Equally important, what would be involved in creating the "challenging and rigorous curriculum for all students" that many are now demanding? What is even meant by "rigor" today, and how do we get more of it in our students' classes? High school students could be required to take more college-prep and Advanced Placement courses, but would they graduate "jury-ready" as a result? Would they know how to distinguish fact from opinion, weigh evidence, listen with both head and heart, wrestle with the sometimes conflicting principles of justice and mercy, and work to seek the truth with their fellow jurors? The overwhelming number of responses I received following an article I wrote in 2006, "Rigor on Trial," in which I explored these questions, indicated to me that there is a great deal of confusion about what rigor really means today.² Many people—from superintendents to teachers to parents—wrote me e-mails wanting more information. How was I redefining rigor for the twenty-first century, and what form did it take in classrooms? Could I put them in touch with schools where students were being taught to think? This book project was born out of my urgent need to find better answers to these questions.

I offer this personal introduction so that readers might understand something of my intellectual journey—what my biases are, what drives me, and what I worry most about—all of which have in various ways propelled

me to write *The Global Achievement Gap*. This is a book for leaders from all walks of life—business, community, and political leaders as well as parents and educators who lead the way. I hope that it will also be of interest to thoughtful young people like my three children and their spouses, who are emerging leaders. It was written for people who care deeply about how we educate the next generation, and for people who are willing to ask tough questions and say what they think. For this book is not just another intellectual exercise—at least not for me, and I hope not for you, either. Above all, *The Global Achievement Gap* is a call to action.

Introduction

The formulation of the problem is often more important than the solution.

—EINSTEIN

Some Facts We Need to Face

- The high school graduation rate in the United States—which is about 70 percent of the age cohort—is now well behind that of countries such as Denmark (96 percent), Japan (93 percent), and even Poland (92 percent) and Italy (79 percent).¹
- Only about a third of U.S. high school students graduate ready for college today, and the rates are much lower for poor and minority students. Forty percent of *all* students who enter college must take remedial courses.² And while no hard data are readily available, it is estimated that one out of every two students who start college never complete any kind of postsecondary degree.
- Sixty-five percent of college professors report that what is taught in high school does not prepare students for college. One major reason is that the tests students must take in high school for state-accountability purposes usually measure 9th or 10th grade-level knowledge and skills. Primarily multiple-choice assessments, they rarely ask students to explain

their reasoning or to apply knowledge to new situations (skills that are critical for success in college), so neither teachers nor students receive useful feedback about college-readiness.³

- In order to earn a decent wage in today's economy, most students will need at least some postsecondary education. Indeed, an estimated 85 percent of current jobs and almost 90 percent of the fastest-growing and best-paying jobs now require postsecondary education. Even today's manufacturing jobs now largely require postsecondary training and skills.⁴ According to the authors of "America's Perfect Storm": "Over the next 25 years or so . . . nearly half of the projected job growth will be concentrated in occupations associated with higher education and skill levels. This means that tens of millions more of our students and adults will be less able to qualify for higher-paying jobs. Instead, they will be competing not only with each other and millions of newly arrived immigrants but also with equally (or better) skilled workers in lower-wage economies around the world."⁵

- The United States now ranks tenth among industrial nations in the rate of college completion by 25- to 44-year-olds.⁶

- Students are graduating from both high school and college unprepared for the world of work. Fewer than a quarter of the more than 400 employers recently surveyed for a major study of work-readiness reported that new employees with four-year-college degrees have "excellent" basic knowledge and applied skills. Among those who employ young people right out of high school, nearly 50 percent said that their overall preparation was "deficient."⁷

- Only 47 percent of 18- to 24-year-olds voted in the last presidential election, compared to 70 percent of 34- to 74-year-olds.⁸

The conventional view of the underlying problems suggested by these data is simply that our schools are "failing." We've heard this line from Republicans and Democrats alike. We've heard it in the media and from academics and policy pundits. We've heard it so often that it has become the accepted wisdom of the day. But what I see in high school classrooms all over the country suggests a different conclusion. What I see there is, in fact, not very different from what I saw thirty-five years ago when I began my career as a teacher—or even what I experienced as a high school student myself. No better, and no worse. Just more testing—and more teaching to the tests.

My view is that the numbers cited in the above list, taken together, point to a new and little-understood challenge for American education: In today's highly competitive global "knowledge economy," *all students need new skills* for college, careers, and citizenship. The failure to give all students

these new skills leaves today's youth—and our country—at an alarming competitive disadvantage. Schools haven't changed; the world has. And so our schools are not failing. Rather, they are obsolete—even the ones that score the best on standardized tests. This is a very different problem requiring an altogether different solution.

What are these new skills, and why they have become so important? Why don't our schools—even the best ones—teach and test them? What are the best ways to hold our schools accountable, and how do we need to differently prepare and support educators to meet these new challenges? How do we motivate today's students to want to excel in this new world, and what do good schools look like that are meeting these challenges and getting dramatically better results? What can and must we do as citizens about this growing *global achievement gap*? These are some of the questions I address in this book.

A New Context for Schooling

A little over fifty years ago, Rudolf Flesch wrote a slim volume titled *Why Johnny Can't Read*. More than any other book, this one started the “reading wars”—vehement and often ideologically driven debates about the best way to teach students how to read, which continue to this day—but the nature of the disagreements matters less than the topic. Throughout much of the twentieth century the basic skills of reading, computation, and rudimentary writing were the focus of our attention in schools and at home. For most students, a “rigorous” curriculum meant having to memorize more vocabulary words and do more math problems at night. There were disputes among academics and parents alike over the ways in which various skills were best taught, but there was no disagreement about their importance. Thomas Jefferson first declared literacy to be the key to citizenship. And, increasingly in the twentieth century, the “Three R's” became essential in the workplace as well.

However, in the twenty-first century, mastery of the basic skills of reading, writing, and math is no longer enough. Almost any job that pays more than minimum wage—both blue and white collar—now calls for

employees who know how to solve a range of intellectual and technical problems, as we will learn in Chapter 1. In addition, we are confronted by exponential increases of readily available information, new technologies that are constantly changing, and more complex societal challenges such as global warming. Thus, work, learning, and citizenship in the twenty-first century demand that we all know how to *think*—to reason, analyze, weigh evidence, problem-solve—and to *communicate effectively*. These are no longer skills that only the elites in a society must master; they are essential survival skills for all of us.

What I have seen in some of our best public schools over the past decade is that while Johnny and Juan and Leticia are learning how to read, at least at a basic level, they are not learning how to think or care about what they read; nor are they learning to clearly communicate ideas orally and in writing. They memorize names and dates in history, but they cannot explain the larger significance of historical events. And they may be learning how to add, subtract, and multiply, but they have no understanding of how to think about numbers. Not knowing how to interpret statistics or gauge probability, many students cannot make sense of the graphs and charts they see every day in the newspaper. They are required to memorize (and usually quickly forget) a wide range of scientific facts, but very few know how to apply the scientific method—how to formulate a hypothesis, test it, and analyze the results. Yet this way of thinking is at the very heart of many kinds of analysis and research. Finally, I have observed that the longer our children are in school, the less curious they become. Effective communication, curiosity, and critical-thinking skills, as we will see, are much more than just the traditional desirable outcomes of a liberal arts education. They are essential competencies and habits of mind for life in the twenty-first century.

The simplest explanation for the low level of intellectual work and general lack of curiosity found in classrooms—even in our best high schools—is that our schools were never designed to teach *all* students how to think. Since our system of public education came into being at the turn of the last century, the assumption has been that only those in the college-preparatory classes were going to have to learn how to reason, problem-solve, and so on, and historically they comprised only a small percentage of students. And even those few often learned such skills in school more by accident than by design. For the most part, teachers haven't been trained to teach students how to think. The textbooks and tests we used in the past were not designed to teach and assess the ability to reason or analyze—and they remain substantially the same today.

Throughout history and until very recently, most people worked with their hands—not with their heads—and so they didn't need these analytical skills in their daily life. Many generations of the most successful students were often more likely to learn how to think from the conversations they had with parents at the dinner table or during family trips than from their classes. They came to school smart and motivated and left the same, and whatever “value-added” some teachers provided often was and continues to be the result of random acts of excellence—at least in public schools. Private schools were established to educate the elite and so have always demanded more of students, but these schools educate less than 5 percent of the high school student population.

If you doubt my observations about public school classrooms, then those of you who attended these schools should simply ask yourself: How many of your high school teachers demanded that you really think in your oral and written work—as opposed to merely memorizing and regurgitating? How often were you required to write an essay in which you developed your own well-reasoned interpretation of a piece of literature or the significance of an event in history? How frequently did you have to develop and test a hypothesis for a science class or explain your thinking about how you solved a complex math problem? How often were you asked by a teacher, “So what do you think about . . .”? I don't mean just once in a while—I mean every day. Even students in many private schools aren't asked to do these things nearly as often as I think they should be.

Many of you who are reading this book may have been in a college or honors track in your high school and so could not see the kind of education the majority of your peers were getting in the other classes. Students in the lower academic tracks—a high percentage of whom were poor and minority students—rarely had intellectual challenges of any kind. And this remains true to this day. Boredom continues to be a leading cause of our high school dropout rate—a problem we'll explore in depth later on.

Teaching all students to think and to be curious is much more than a technical problem for which educators, alone, are accountable. And more professional development for teachers and better textbooks and tests, though necessary, are insufficient as solutions. The problem goes much deeper—to the very way we conceive of the purpose and experience of schooling and what we expect our high school graduates to know and be able to do. Those of us who are old enough to have school-aged children had a set of experiences in school that define for us what learning is supposed to look like, and in most cases our past experience still shapes how we think about school. But these preconceptions may also prevent us

from clearly understanding how very different the experience of schooling must be for children growing up in a new century. In the coming pages, I will invite you to question your assumptions about what all students should know—what it means to be an educated adult in the twenty-first century—as well as about what good teaching looks like, and how we should assess what students are learning.

I invite you to ask yourself these questions not as a philosophical exercise but, rather, because new answers are needed for our own economic survival—and that of our children. We have learned from the writings of Thomas Friedman, Daniel Pink, and many others that our children must now compete for jobs with increasingly well-educated young people from around the world.⁹ Technology has enabled a growing number of routine jobs—both blue and white collar—to be either “off-shored” or automated. These changes compel us to rethink what kind of education all of our young people will need in order to get—and to keep—a good job.

Economic survival is not the only factor that we must consider as we rethink education goals for the twenty-first century. To better understand how all of our schools must adapt to new realities, we need to explore three fundamental transformations that have taken place in a very short period of time:

- the rapid evolution of the new global “knowledge economy,” with profound effects on the world of work—all work.
- the sudden and dramatic shift from information that is limited in terms of amount and availability to information characterized by flux and glut.
- the increasing impact of media and technology on how young people learn and relate to the world—and to each other.

Separately, each of these transformations represents enormous challenges to our education system. Taken together, they compel a fundamental reconsideration of all of our assumptions about what children need to learn and how learning takes place. In the chapters that follow, I will explore these three forces of change and their implications for teaching, testing, schooling, training educators, and motivating today’s students.

In Chapter 1, we’ll look at how the world of work is changing and how these and other changes have created an imperative for individuals to master what I call the Seven Survival Skills—the skills that matter most for work, learning, and citizenship in today’s global “knowledge economy.” Then, in Chapter 2, we’ll contrast this New World of Work with the Old World of School—a world that has remained virtually unchanged for more than a half-century. In particular, we’ll visit classes in some of our most

highly regarded public schools to explore the extent to which these new survival skills are being taught. In Chapter 3, we'll look at the standardized, multiple-choice tests that students must take with increasing frequency and see what they are really like. We'll explore why and how these tests became so prevalent and gauge their influence on education today; we'll also look at some new assessments that have the potential to hold schools accountable for the skills that matter most.

The fact that future educators must be differently trained and supported in their work is the subject of Chapter 4. Chapter 5 explores the ways in which members of the "Net Generation" have been shaped by the very different world in which they've grown up, as well as the challenges involved in motivating today's students and tomorrow's workers. In Chapter 6, we'll take a tour of three remarkable high schools that show how the Seven Survival Skills can be taught and assessed and that point the way toward a new vision for education. And finally, in the Conclusion, we'll consider some questions—questions for me and questions for you—about what we can do to create a very different dialogue about teaching and learning and testing in the twenty-first century.

In *The Global Achievement Gap*, I begin by discussing why today's students must be taught how to think—all students, not just those labeled as "gifted and talented"—and then I explore some of the essential questions that we must answer if we are to take this goal seriously. What changes must be made within the education system to prepare our nation's students for both analytic and creative thinking? What must teachers do differently to stimulate students' imaginations? What kinds of tests must be given to students to show whether we are making progress toward these ambitious goals? Determining the answers to these questions is important indeed; but, as Einstein suggested, "the formulation of the problem" is even more so.

The "problem," simply stated, is that the future of our economy, the strength of our democracy, and perhaps even the health of the planet's ecosystems depend on educating future generations in ways very different from how many of us were schooled. In this book, we embark on a journey together, not only to understand this global achievement gap but also to discover new ways of thinking about education and best practices in schools that are preparing *all* students for learning, work, and citizenship in the twenty-first century.

CHAPTER 1
The New World of Work and the Seven Survival Skills

Initial Encounters with New World “Natives”

In April 2006, I was on my way to give a speech at an educators’ conference outside of Minneapolis. On my flight, I happened to sit next to Clay Parker, the president of the Chemical Management Division of BOC Edwards—a company that, among other things, makes the machines and supplies the chemicals for the manufacture of microelectronics devices, including silicon semiconductors and flat-panel displays. It turned out that he had three children and was deeply interested in education issues. I also found out that, as CEO, he chooses to be very involved in his company’s hiring of new employees. For the last few years, I’d been reading about the rapidly changing world of work and had grown increasingly concerned that our schools weren’t adequately preparing students for today’s workplace. I’d decided that I wanted to interview employers about the skills they now look for when they hire young people. So I asked Parker what qualities he most wants in a potential new employee. I expected a list of technical skills—especially since Parker is an engineer by training—but I was way off the mark.

“First and foremost, I look for someone who asks good questions,” Parker responded. “Our business is changing, and so the skills our engineers need change rapidly, as well. We can teach them the technical stuff. But for employees to solve problems or to learn new things, they have to know what questions to ask. And we can’t teach them how to ask good questions—how to think. The ability to ask the right questions is the single most important skill.”

“What other skills are you looking for?” I asked, expecting that he’d jump quickly to content expertise.

“I want people who can engage in good discussion—who can look me in the eye and have a give and take.”

“I don’t understand,” I confessed.

“All of our work is done in teams. You have to know how to work well with others. But you also have to know how to engage the customer—to find out what his needs are. If you can’t engage others, then you won’t learn what you need to know.”

I couldn't quite believe what I was hearing. This guy, who was an engineer and head of a very technical business, said that he most valued employees who could ask good questions and engage others! I was surprised but also a bit skeptical. He didn't fit my stereotype of a CEO—or an engineer, for that matter—with his emphasis on “soft” skills for a hard-edged, high-tech world.

Later, the conversation turned to our children and their schools. Parker happened to mention that one of his children had had a difficult start to his school year when he challenged something a teacher said. It took several months—and some candid conversations between the teacher and the parents—before the teacher finally decided that Parker's child was not a trouble-maker. I made a mental note: *Corporate CEO most values asking good questions; his child gets into trouble at school for asking the teacher a question.* The problem of students getting into trouble for challenging something a teacher says is not new to me, but I found this juxtaposition especially jarring.

I asked Parker what he and his wife were most concerned about when it came to the schools their children attended. “My wife and I fully support the aims of No Child Left Behind,” he said, referring to the landmark 2002 education legislation aimed at closing the achievement gap by holding schools more accountable through increased use of standardized tests. “But our children's teachers take more than a month before the testing begins to teach and review the materials that are going to be on the test, so they are clearly teaching to the test, rather than teaching for a deeper understanding of the content.”

Only a month of teaching to the test, I thought. Little does he know. His children go to schools in a good suburban district, whereas in schools that serve more economically disadvantaged kids, teaching to the test is the *only* curriculum—not for a month, but for the entire year. But the more important point for me: Here was a man who headed the division of a company that was in direct competition with companies in India and China—a growing company that created good jobs for American youth—and he was very clear about the kinds of skills he needed in employees. He was also quite aware that our current education reform initiatives, while trying to address the problem of the achievement gap between middle-class and poor kids, might not result in all students knowing how to ask good questions. Clay and I agreed to stay in touch, and I went on to my speaking engagement, inspired by this intriguing conversation with a New World “native” who had challenged some of my assumptions about the work world today.

For many years, I have traveled to schools and conferences across the country to consult, offer workshops, and give talks. As part of my talks with teachers, principals, and parents, I often show fifteen minutes or so of a classroom video and then ask the audience to grade the lesson given by the teacher. No matter which video I choose, the narrowest grade range I've ever received is *A* to *D*. In other words, even veteran groups of educators have widely differing views on the quality of a lesson. (We'll explore some of the reasons why this is true in Chapter 4.) Back at the conference in Minneapolis, I conducted this exercise with the attendees, and the grades they reported ranged from *A* to *F*, which is quite common. Yet I felt disheartened, as I do at many gatherings that generate similar results when everyone has a different understanding of what a good lesson is all about. It's like trying to bail out the ocean with a bucket. I thought of my conversation with Clay Parker. I wished educators and parents could have listened to him talk about the importance of teaching kids how to ask good questions—how to think, as opposed to merely covering the chapters in the textbooks and preparing for multiple-choice tests. Hearing his ideas might have made it easier for them to reach an agreement on what good teaching really looks like. But then, this was only one interview, and maybe I'd find out that Parker's views on the skills that mattered most for young people today were out of step with those of other business leaders.

Soon after I returned to Boston, I sat down with Christy Pedra, who currently serves as president and CEO of Siemens Hearing Instruments—one of the largest hearing-instrument manufacturers in the world. Siemens is a highly diversified company with 470,000 employees around the globe. Their operations include development and manufacture of technologies for automation and control; information, transportation, and power systems; medical devices; and many more. A business that values innovations in technology, Siemens needs highly skilled employees, and it creates the kinds of jobs we most want and need to keep for our young people here in this country. So I was eager to hear Pedra's perspective on the skills that matter most in her business.

Just five minutes into the conversation, as Pedra was explaining some of the core competencies her company expects of all employees, she said something that took me by surprise, just as the statement from Parker had done just a few weeks before: "I ask questions for a living," she told me.

Pedra went on: "The majority of my years in the corporate world have been in sales. When you're in a sales and marketing environment, it's really important that you understand your customer. I've found that the best way

to understand people is to ask questions. I ask questions all day long. If I ask the right questions, I get information that allows me to be more successful in a variety of ways. If I'm talking to customers, I'm more successful because I understand their business and their needs. I understand their perspective on a problem that has to be solved. If I'm dealing with employees and I ask questions, I understand how they think, where they're coming from as they try to solve a problem, what they've done so far to address an issue. So it really comes down to how well you ask questions."

Pedra elaborated: "Questioning techniques that I've learned over the years have actually become very useful in raising my three children—which they'll hate to hear! They call me the head of the CIA—the Child Interrogation Association. They say the real CIA and FBI have nothing on me. But I keep asking them questions like: 'So tell me how this year's history class is different from last year's. What was good and what was bad?'"

Pedra's reference to her children and their classes led me to ask how she assessed the job the public schools were doing for her children. The school system in her community has a reputation for being one of the best in the state, and so I expected a glowing review.

"They're spending too much time getting kids ready to take the MCAS test." (She was referring to the Massachusetts Comprehensive Assessment System, which is widely viewed as one of the most rigorous of all the new state tests.) "And they're not measuring the right things. If you want to encourage young people to be scientists, it's not how much they can retain but how much they can explore. It's how you ask the next question. I can look up anything, but I can't take it to the next level without pushing and exploring. And that's what I want young people to learn to do. I want them to never stop asking questions."

Like Parker, Pedra believed that the ability to ask good questions and engage others were critical competencies for work today. They also expressed the same concern about their children's suburban public schools—schools that many of us consider to be among the best in the country: too much teaching to the test, too much time memorizing, at the expense of spending time on the thinking skills that are more important.

Ironically, the increased emphasis on testing has come about because of a growing fear, shared by many in this country, that if we don't turn out better-educated and more highly qualified students—especially in math and science—then more and more of our best jobs will go to better-prepared students in developing countries. This is a large part of the rationale among

business leaders and policymakers for an increased emphasis on testing at all grade levels and requiring more academic courses in math and the sciences, as well as promoting more Advanced Placement courses in our high schools. Yet, both Parker and Pedra told me that the preparation that mattered most for their companies' jobs was less about technical skills and knowledge than about learning how to think, and *their* concern was that time spent on test preparation and memorizing more content knowledge comes at the expense of teaching students to use their minds well.

Who was right? I wondered what a real scientist would say. I set up an interview with Jonathan King, an internationally renowned molecular biologist who teaches a range of biology courses to both undergraduate and graduate students at the Massachusetts Institute of Technology. He also directs a research lab at MIT and has spent nearly fifty years training future scientists for work at universities and the leading bio-tech labs in the country.

King sent both of his two sons through the highly regarded Cambridge Massachusetts public schools, and he described a troubling change that had occurred between the times his first and his second son attended 4th grade. "They went to the same school and had the same teacher," King explained. "My eldest son had a great experience. His class went over to the pond at Mount Auburn Cemetery and took samples from the muck. They brought them back to school and studied what they found. They discovered all kinds of creatures there—ones that even I hadn't seen! It was great, 'hands-on' science, and it really motivated my son.

"But my second son's experience was totally different. Now all the kids had to take the MCAS tests, and the teachers felt they couldn't take the time for 'fun stuff.' They felt they couldn't take the time to collect and study the muck. They had to prepare all the kids for the tests."

"I worry about the future of science in this country," he told me later in the conversation. "For kids to get passionate about science, they have to get their hands dirty—literally. They have to have labs where they study things in depth and learn to observe, instead of just memorizing facts from a textbook. The kids who take my intro lab courses today have gotten top scores on all the Advanced Placement science courses in their high schools, but they don't know how to *observe*. I ask them to describe what they see in the microscopes, and they want to know what they should be looking for—what the right answer is."

Since completing these initial interviews, I've had several hundred conversations with business, nonprofit, philanthropic, and education leaders—from CEOs to college professors, state superintendents, school

principals, and teachers. I've talked to senior executives from Apple to Unilever—representing high-tech and retail businesses, basic manufacturing operations, and even the U.S. Army. I've done extensive interviews with senior consultants who work with a wide variety of corporations. And I've conducted numerous focus groups and interviews with high school and college students and young adults. I've also reviewed the research on issues related to “workforce preparedness.” Meanwhile, I have continued to spend time in schools working with educators and observing classes nearly every week—and I have to tell you that I've come to see something that has truly frightening implications for the future of our country.

The *Global* Achievement Gap

Increasingly in America today—and in other countries, as well—there are *two* achievement gaps in our education systems. The first of these—well-documented, widely discussed, and the focus of education reform efforts for the past decade or so—is the gap between the quality of schooling that most middle-class kids get in America and the quality of schooling available for most poor and minority children—and the consequent disparity in results. The second one is the *global* achievement gap, as I've come to call it—the gap between what even our *best* suburban, urban, and rural public schools are teaching and testing versus what *all* students will need to succeed as learners, workers, and citizens in today's global knowledge economy. As a country, we've been striving to close the first achievement gap by bringing our poorest schools up to the standards of our middle-class schools—mainly through increased testing and greater accountability for progress, as measured by the tests. However, it has become increasingly clear to me that even in these “good” schools, students are simply not learning the skills that matter most for the twenty-first century. Our system of public education—our curricula, teaching methods, and the tests we require students to take—were created in a different century for the needs of another era. They are hopelessly outdated.

The global achievement gap remains invisible to most of us—in part, because it is fueled by fundamental economic, social, political, and technological changes that have taken place so rapidly over the last two decades that they seem more like static in people's lives than like tangible forces that are shaping our future. But these changes are powerful, and until we understand them and rethink what young people need to know in the twenty-first century and how they are best taught, our future as a

country remains uncertain. In this “newly flattened world,” to borrow a phrase from Thomas Friedman, the universe in which our children must compete and succeed has been rapidly transformed by groundbreaking and rapidly evolving technologies, as well as by the stunning economic growth of countries such as China, India, Thailand, the Philippines, and many more. Similarly, since 9/11, new threats to our democracy have emerged. And now global warming may threaten the systems that sustain life on this planet.

To deal with these challenges and others that will inevitably emerge, we need to ensure that students are differently educated for the future. If we were “a nation at risk” in 1983—a phrase that comprised the title of a famous education report released that year decrying the “rising tide of mediocrity” in our public education system—we are today far more seriously at risk than most people realize. And while No Child Left Behind (NCLB) was well intended, its implementation is, in fact, putting all of our children further behind in acquiring the new survival skills for learning, work, and citizenship.

I came to understand the concept of the global achievement gap through my research on the competencies that young people need today in order to be prepared for the world of work. I wanted to find out what a high school graduate today would need to know in order to succeed at a “good” job that paid more than minimum wage. I wanted to know how employers assessed the preparedness of our high school and college graduates to compete for good jobs with the rapidly growing number of well-educated young people from other countries. I was also interested in exploring the extent to which adapting to the needs of the workplace might be at odds with being an independent thinker and a good citizen—a disparity that many educators assume to be the case. For I believed then—and still do—that we will have gained little as a country if we solve the problem of preparation for work at the expense of preparing all students to be active and informed citizens in a democracy. We must do both.