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Learning to Think

WHEN YOU HEAR someone extol the benefits of a liberal education, you will probably hear him or her say that "it teaches you how to think." I'm sure that's true. But for me, the central virtue of a liberal education is that it teaches you how to write, and writing makes you think. Whatever you do in life, the ability to write clearly, cleanly, and reasonably quickly will prove to be an invaluable skill.

In my freshman year of college, I took an English composition course. My teacher, an elderly Englishman with a sharp wit and an even sharper red pencil, was a tough grader. He would return my essays with

dozens of comments written in the margins, each one highlighting something that was vague or confusing or poorly articulated. I realized that in coming from India, I was pretty good at taking tests and regurgitating things I had memorized; I was not so good at expressing my own ideas. By the time I got to college, I had taken many, many exams but written almost no papers. That was not unusual even at a good high school in Asia in the 1970s, and it's still true in many places there today.

Over the course of that semester, I found myself starting to make the connection between my thoughts and words. It was hard. Being forced to write clearly means, first, you have to think clearly. I began to recognize that the two processes are inextricably intertwined. In what is probably an apocryphal story, when the columnist Walter Lippmann was once asked his views on a particular topic, he is said to have replied, "I don't know what I think on that one. I haven't written about it yet."

In modern philosophy, there is a great debate as to which comes first—thought or language. Do we think abstractly and then put those ideas into words, or do we think in words that then create a scaffolding of thought? I can speak only from my own experience. When I begin to write, I realize that my "thoughts" are usually a jumble of half-formed ideas strung together, with gaping holes between them. It is the act of writing that forces

me to sort them out. Writing the first draft of a column or an essay is an expression of self-knowledge—learning just what I think about a topic, whether there is a logical sequence to my ideas, and whether the conclusion flows from the facts at hand. No matter who you are—a politician, a businessperson, a lawyer, a historian, or a novelist—writing forces you to make choices and brings clarity and order to your ideas.

If you think this has no earthly use, ask Jeff Bezos, the founder of Amazon. Bezos insists that his senior executives write memos, often as long as six printed pages, and begins senior-management meetings with a period of quiet time, sometimes as long as thirty minutes, while everyone reads the "narratives" to themselves and makes notes on them. If proposing a new product or strategy, the memo must take the form of a press release, using simple, jargon-free language so that a layperson can understand it. In an interview with *Fortune*'s Adam Lashinsky, Bezos said, "Full sentences are harder to write. They have verbs. The paragraphs have topic sentences. There is no way to write a six-page, narratively structured memo and not have clear thinking."

Norman Augustine, reflecting on his years as the CEO of Lockheed Martin, recalled that "the firm I led at the end of my formal business career employed

some one hundred eighty thousand people, mostly college graduates, of whom over eighty thousand were engineers or scientists. I have concluded that one of the stronger correlations with advancement through the management ranks was the ability of an individual to express clearly his or her thoughts in writing."

The second great advantage of a liberal education is that it teaches you how to speak. The Yale-NUS report states that the college wants to make "articulate communication" central to its intellectual experience. That involves writing, of course, but also the ability to give compelling verbal explanations of, say, scientific experiments or to deliver presentations before small and large groups. At the deepest level, articulate communication helps you to speak your mind. This doesn't mean spouting anything and everything you're thinking at any given moment. It means learning to understand your own mind, to filter out underdeveloped ideas, and then to express to the outside world your thoughts, arranged in some logical order.

Another difference that struck me between school in India and college in the United States was that talking was an important component of my grade. My professors were going to judge me on my ability to think through the subject matter and to present my analysis and conclusions—out loud. The seminar, a

form of teaching and learning at the heart of liberal education, helps you to read, analyze, and dissect. Above all, it helps you to express yourself. And this emphasis on "articulate communication" is reinforced in the many extracurricular activities that surround every liberal arts college—theater, debate, political unions, student government, protest groups. In order to be successful in life, you often have to gain your peers' attention and convince them of your cause, sometimes in a five-minute elevator pitch.

The study and practice of speech actually figured far more prominently in the early centuries of liberal education. Rhetoric was among the most important subjects taught—often *the* most important. It was intimately connected not only with philosophy but also with governance and action. In the centuries before print, oral communication was at the center of public and professional life. The eighteenth- and nineteenth-century college curricula in Britain and the United States maintained that emphasis on oratory.

In the twentieth century, as research became the major focus of large universities, and the printed text became the dominant method of mass communication, the emphasis on speech faded, especially in the United States. In Great Britain, public speaking remains prominent in a tradition of poetry recitation

and elocution, debate and declamation. At the center of Britain's political life stands the House of Commons, a venue in which the ability to thrust and parry verbally gains a politician notice by his or her peers. That's why so many Britons sound intelligent, lucid, and witty—it's not just the accent. The rise of television and digital video have made verbal fluency useful, sometimes crucial. Whether for public or private communication, the ability to articulate your thoughts clearly will prove to be a tremendous strength. No matter how strong your idea, you have to be able to convince others to get behind it.

A related method of learning through the ages has been something that is often thought of as pure pleasure—conversation. "Conversation," a former president of Yale, A. Whitney Griswold, wrote, "is the oldest form of instruction of the human race," defining it as "the great creative art whereby man translates feeling into reason and shares with his fellow man those innermost thoughts and ideals of which civilization is made." The scientist and philosopher Alfred North Whitehead once confessed that "outside of the book-knowledge which is necessary to our professional training, I think I got most of my development from the good conversation to which I have always had the luck to have access." This is probably the insight behind the "open-plan

office" that encourages meetings, chats, and conversation throughout the workday. For my part, I have found that interviewing people, exchanging views with peers and friends, and arguing at editorial meetings have been crucial to learning.

That brings me to the third great strength of a liberal education: it teaches you how to learn. I now realize that what I gained from college and graduate school, far more lasting than any specific set of facts or piece of knowledge, has been the understanding of how to acquire knowledge on my own. I learned how to read an essay closely, search for new sources, find data to prove or disprove a hypothesis, and detect an author's prejudices. I learned how to read a book fast and still get its essence. I learned to ask questions, present an opposing view, take notes, and, nowadays, watch speeches, lectures, and interviews as they stream across my computer. And most of all, I learned that learning was a pleasure—a great adventure of exploration.

Whatever job you take, the specific subjects you studied in college will probably prove somewhat irrelevant to the day-to-day work you will do soon after you graduate. And even if they are relevant, that will change. People who learned to write code for computers just ten years ago now confront a new world of apps and mobile devices. What remain constant

are the skills you acquire and the methods you learn to approach problems. Given how quickly industries and professions are evolving these days, you will need to apply these skills to new challenges all the time. Learning and re-learning, tooling and retooling are at the heart of the modern economy. Drew Faust, president of Harvard University, has pointed out that a liberal education should give people the skills "that will help them get ready for their sixth job, not their first job."

You might also need to experiment with varieties of intelligence, not just one. Howard Gardner, a developmental psychologist and expert on education, has posited that there are at least eight kinds of intelligence: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, naturalistic, intrapersonal, and interpersonal. To be properly prepared for today's world, students must experience several methods of learning conducive to these various intelligences. America's loose and open system of higher education allows for this kind of experimentation. This is what prompted Gardner to write, "There is a joke in my trade that one should go to infant school in France, preschool in Italy, primary school in Japan, secondary school in Germany, and college or university in the United States."

Thomas Cech—Nobel Prize–winning chemist and graduate of Grinnell College, a classic liberal arts

school—makes a sports analogy to illustrate a similar insight. Just as athletes do exercises unrelated to their own sport, so students should study fields outside their academic area of focus. "Cross-training may exercise key muscle groups more effectively than spending the same amount of time working out in the sport of interest," Cech writes. "Analogously, a liberal arts education encourages scientists to improve their 'competitive edge' by cross-training in the humanities or arts. Such academic cross-training develops a student's ability to collect and organize facts and opinions, to analyze them and weigh their value, and to articulate an argument, and it may develop these skills more effectively than writing yet another lab report."

Gardner argues that in the future, students will focus even more on modes of thinking. After all, with facts being just a Google search away, why waste brain cells memorizing them? He notes that the best thinking often happens when ideas, fields, and disciplines collide, in a setting where cultures rub up against one another. In the same vein, he rejects a great-books approach to learning—more so than I would. The point of education, in his view, is not to stock students' minds with antique furniture, but to help them gain the intellectual skills they require to build their own set of chairs and tables. He would favor a curriculum

that exposes students to different ways of thinking—observational, analytic, aesthetic, teamwork oriented, and so on (which sounds a lot like the Yale-NUS program). Such a curriculum is now known to produce results. Drawing on his knowledge of psychology and neuroscience, Gardner asserts that "it borders on malpractice to design education that is backward-looking and that ignores what we now understand about how the mind constructs and reconstructs knowledge."

Technology and engineering involve extraordinary explorations of ideas and thought, something that is often lost because of their real-world application. They are scientifically fascinating, whether or not they will make you rich. I remember being amazed by the first computers I saw in India in the 1970s, but I didn't have any sense that they would produce lucrative new industries. In those days, the computer programming I learned involved using punch cards and mastering FORTRAN, a language long-since dead. Even in that cumbersome format, the machine's incredible power was evident. It was also fun to learn something so new. Computers have transformed the world in ways that are now blindingly obvious. But with all the money surrounding them, we can easily forget the intellectual pleasure they can give. Big data, artificial intelligence, and mobile computing all might produce great new

companies, but they also take us into areas of knowledge where we have never been before. And whether or not that makes someone a billionaire, it is a thrilling intellectual journey that asks profound questions about the nature of the mind—a return in some ways to the idea of science as a branch of philosophy.

Even technical skills by themselves are a wonderful manifestation of human ingenuity. But they don't have to be praised at the expense of humanities, as they often are today. Engineering is not better than art history. Society needs both, often in combination. When unveiling a new edition of the iPad, Steve Jobs explained that "it is in Apple's DNA that technology alone is not enough. It's technology married with liberal arts, married with the humanities, that yields us the result that makes our hearts sing."

That marriage is not simply a matter of adding design to technology. Consider the case of Facebook. Mark Zuckerberg was a classic liberal arts student who also happened to be passionately interested in computers. He studied ancient Greek intensively in high school and was a psychology major when he attended college. The crucial insights that made Facebook the giant it is today have as much to do with psychology as they do technology. In interviews and talks, Zuckerberg has often pointed out that

before Facebook was created, most people shielded their identities on the Internet. The Internet was a land of anonymity. Facebook's insight was that you could create a culture of real identities, where people would voluntarily expose themselves to their friends, and this would become a transformative platform. Of course, Zuckerberg understands computers deeply and now uses great coders to put his ideas into practice, but his understanding of human psychology was key to his success. In his own words, Facebook is "as much psychology and sociology as it is technology."

Technology and liberal education go hand in hand in business today. Twenty years ago, tech companies might have survived simply as industrial product manufacturers. Now they have to be at the cutting edge of design, marketing, and social networking. Many other companies also direct much of their attention toward these fields, since manufacturing is increasingly commoditized. You can make a sneaker equally well in many parts of the world. But you can't sell it for three hundred dollars unless you have built a story around it. The same is true for cars, clothes, and coffee. The value added is in the brand—how it is imagined, presented, sold, and sustained. Bruce Nussbaum, an expert on innovation, wrote in a 2005 essay in *Businessweek* that the "Knowledge Economy as we know it is being eclipsed by some-

thing new—call it the Creativity Economy. . . . What was once central to corporations—price, quality, and much of the left-brain, digitized analytical work associated with knowledge—is fast being shipped off to lower-paid, highly trained Chinese and Indians, as well as Hungarians, Czechs, and Russians. Increasingly, the new core competence is creativity—the right-brain stuff that smart companies are now harnessing to generate top-line growth. . . . It isn't just about math and science anymore. It's about creativity, imagination, and, above all, innovation."

David Autor, the MIT economist who has most carefully studied the impact of technology and globalization on jobs, writes that "human tasks that have proved most amenable to computerization are those that follow explicit, codifiable procedures—such as multiplication—where computers now vastly exceed human labor in speed, quality, accuracy, and cost efficiency. Tasks that have proved most vexing to automate are those that demand flexibility, judgment, and common sense—skills that we understand only tacitly—for example, developing a hypothesis or organizing a closet. In these tasks, computers are often less sophisticated than preschool age children." This doesn't in any way detract from the need for training in technology, but it does suggest that as we

work with computers—which is really the future of all work—the most valuable skills will be the ones that are uniquely human, that computers cannot quite figure out—yet.

Autor divides the job market into three slices. A *Fast Company* article nicely summarizes his research. "At the bottom of the market, there's a growing number of service sector jobs that require hands-on interaction in unpredictable environments—driving a bus, cooking food, caring for children or the elderly. These are impossible to outsource or replace with technology," it notes. The middle tier is made up of jobs that are white collar but are also routine. They involve information processing, form filing, fact finding, data entry, and simple data analysis. These are white-collar jobs in insurance, banking, and law, and they are increasingly being done better by machines. "At the top of the market are the jobs that everyone wants. And guess what?" the article says, perhaps more optimistically than Autor himself might, "These are the jobs that graduates of the American educational system are well prepared for. [They] require creativity, problem solving, decision making, persuasive arguing, and management skills." Vinod Khosla, a Silicon Valley venture capitalist, argues that machine learning will replace many human jobs, but even he believes that work involving complex cre-

ativity, emotional intelligence, and value judgments will continue to be done by humans.

And then there is the most influential industry in the United States—entertainment, one of the greatest global growth sectors. A 2012 industry report titled *The Sky Is Rising* presented data showing that all business related to entertainment had maintained an upward trajectory, through recessions and recoveries. Between 1995 and 2009, the number of feature films made worldwide more than quadrupled. Between 2008 and 2011, the number of Americans playing video games jumped about two and a half times. Even in book publishing, revenues rose 5.6 percent between the recession years of 2008 and 2010. Music and television as well—everything in the sector is up. This is an industry that employs millions around the world, continues to grow, and enriches economies and cultures. And at its heart are stories, images, words, and songs. Often these artistic elements are further embellished by technology—as in the films *The Lord of the Rings* and *Frozen*. Regardless of how these films are made, it is clear that much of the production of entertainment requires a background and expertise in one of several of the liberal arts.

So there is a value to writing and music and design and art. But what about art history? What is the best response to President Obama and so many others

who worry about the purpose of an academic degree in subjects as seemingly obscure as art history and anthropology? To be fair to the president, his emphasis was on the many millions of Americans who are more inclined to obtain some kind of skills-based training than a liberal education. Perhaps those people would be better off learning a specific technical skill rather than enrolling in a preprofessional-sounding major like "business." But for those who do find that their passion is art history or anthropology, and take it seriously, there are real rewards in the outside world. Both those fields often require the intensive study of several languages and cultures, experience working in foreign countries, an eye for aesthetics, and the ability to translate from one medium or culture to another. Most of these skills could be useful in any number of professions in today's globalized age. They force you to look at people and objects from a variety of perspectives. As Howard Gardner's research demonstrates, this kind of exposure trains various kinds of intelligence, making you a more creative and aware person.

Consider the experience of Dr. Irwin Braverman of the Yale Medical School. In 1998, when he was teaching young medical students who were residents at an affiliated hospital, Dr. Braverman discovered that their powers of observation and diagnosis were weak.

His novel solution was to take them to an art gallery. He teamed up with Linda Friedlander, curator of the Yale Center for British Art, to design a visual tutorial for one hundred students. They asked the students to examine paintings, forcing them to unpack the many layers of detail and meaning in a good work of art. Braverman found that students performed demonstrably better at diagnosis after taking the class—so much so that twenty other medical schools have followed his example.

While this may sound like the quixotic idea of one professor, there are data to support the value of rounded or lateral thinking in the workforce. In 2013, the American Association of Colleges and Universities published a survey showing that 74 percent of employers would recommend a good liberal education to students as the best way to prepare for today's global economy. When students graduate, those with engineering degrees start out with higher salaries—as they should, given that they possess a tangible skillset that can be instantly applied within a company. But over time, the wage gap between engineers and other professionals narrows, especially for liberal arts students who go on to get a professional degree. In fact, one recent study found that students from a set of liberal arts colleges were more likely than their peers

at other institutions of higher education to obtain doctorates in sciences, presumably because they possess an acute curiosity and sense of academic adventure. As I noted, a liberal education might encourage student interest in scientific subjects for their inherent intellectual value, rather than their value in the marketplace. And that might have its own payoffs over time in terms of basic research and scientific advancement.

Norman Augustine (the former Lockheed Martin CEO) stressed the importance of both scientific skills and humanistic thought:

> So what does business need from our educational system? One answer is that it needs more employees who excel in science and engineering. . . . But that is only the beginning; one cannot live by equations alone. The need is increasing for workers with greater foreign-language skills and an expanded knowledge of economics, history, and geography. And who wants a technology-driven economy if those who drive it are not grounded in such fields as ethics? . . .
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> Certainly when it comes to life's major decisions, would it not be well for the leaders and employees of our government and our nation's firms to have knowledge of the thoughts of the world's great philosophers and the provocative dilemmas found in the works of

great authors and playwrights? I believe the answer is a resounding "yes."

Similarly, Edgar Bronfman, former CEO of Seagram Company, has offered students looking to succeed in business one piece of advice:

> Get a liberal arts degree. In my experience, a liberal arts degree is the most important factor in forming individuals into interesting and interested people who can determine their own paths through the future.
>
> For all of the decisions young business leaders will be asked to make based on facts and figures, needs and wants, numbers and speculation, all of those choices will require one common skill: how to evaluate raw information, be it from people or a spreadsheet, and make reasoned and critical decisions.

Yet a sampling of the views of CEOs remains just anecdotal evidence. What does the big picture tell us, in the vast arena of global economic competition? Can liberal education stand up against the instruction in science and technology that has been so finely tuned by Asian nations?

In 2013, the Organisation for Economic Cooperation and Development released the results of

the first-ever survey of the skills adults require to work in the modern economy. Three areas were considered: literacy, numeracy, and technology. The United States performed terribly, scoring below the OECD average in literacy and technological proficiency, and third from the bottom in numeracy. The test was designed to assess problem-solving skills, not rote memorization. The technology test, for instance, asked people to sort computer files into folders. Most troubling is that in numeracy and technological proficiency, young Americans, ages sixteen to twenty-four, ranked last.

This is consistent with the intellectual ability (or lack thereof) that Americans demonstrate earlier in their lives. Every three years since 2000, the OECD has administered a standardized test in science, mathematics, and reading to fifteen-year-olds. The most recent edition of the test—called the Programme for International Student Assessment (PISA)—was conducted in 2012, and it found that among the OECD's thirty-four members, the United States ranked twenty-seventh, twentieth, and seventeenth in math, science, and reading, respectively. If rankings across the three subjects are averaged, the United States comes in twenty-first, trailing nations like the Czech Republic, Poland, Slovenia, and Estonia.

But there is a puzzle. The United States has never per-

formed especially well on international tests. In 1964, the First International Mathematics Study was administered to thirteen-year-olds in twelve countries. On average, thirteen-year-olds in the United States posted a significantly lower score than their counterparts in nine of the countries. Only one education system did worse. In the 1970s and 1980s, studies on mathematic and scientific ability continued to find American students lagging their international peers. Though not always at the bottom of the rankings, the United States has rarely risen far above the middle of the pack. The most recent assessment in the series, called the Trends in International Mathematics and Science Study, was conducted in 2011, and American students did much better. Of fifty education systems tested, the United States ranked eleventh and seventh in fourth-grade math and science, respectively. Of forty-two education systems evaluated, the United States ranked ninth and tenth in eighth-grade math and science. These TIMSS tests, however, are less about conceptual problem solving and more about repeating material that has been studied.

Overall, America's test scores are disappointing, particularly given the United States spends more per capita than almost any other country on education. But how then does one explain the country's success over

the last five decades? And how does one understand why students in Asian countries that typically top the international test charts don't end up producing the world's most creative scientists, entrepreneurs, inventors, composers, and businesspeople? These high-scoring Asian countries do well economically, of course, but they don't do especially well at innovation—so far.

Many years ago, I had a conversation about all this with Singapore's minister of education at the time, Tharman Shanmugaratnam. Singapore is the right country to look at because it sits among the top-performing nations on international tests. And yet, it is actively seeking to boost innovation and entrepreneurship among the students producing those top scores. "We both have meritocracies," Shanmugaratnam said. "Yours is a talent meritocracy, ours is an exam meritocracy. There are some parts of the intellect that we are not able to test well—like creativity, curiosity, a sense of adventure, ambition. Most of all, America has a culture of learning that challenges conventional wisdom, even if it means challenging authority. These are the areas where Singapore must learn from America."

It's not just Singapore that feels this way, which is why it set up the Yale-NUS liberal arts and sciences college. South Korea, which consistently produces top rankings on international tests, is making a major

investment in liberal education. Seoul National University and Yonsei University have expanded their instruction in subjects associated with the liberal arts. Japan has done the same at the University of Tokyo, and in 2004, Waseda University opened a School of International Liberal Studies, though these efforts have yet to bear fruit in any substantial way. India has a long tradition of liberal arts colleges and universities, many dating to the British era and some to the period after independence, like Jawaharlal Nehru University. But none of these institutions are as prestigious as the country's engineering schools. In addition, all are run like the government bureaucracies that they are. Looking to shake up the old system, in recent years, several prominent Indian businessmen have set up new higher-learning institutions oriented toward the liberal arts, such as Azim Premji University and Mahindra United World College. In addition, Ashoka and Nalanda Universities, both of which welcomed their first class of students in 2014, hearken back to India's ancient heritage of philosophy, literature, science, and ethics but in a modern liberal arts and sciences form.

When considering the world's most innovative countries today, in addition to the United States, in Europe one often hears about Sweden, which seems

to have all the new technology companies outside Silicon Valley. And then there is Israel, the subject of a fascinating book detailing its high-technology sector, *Start-up Nation*, by Dan Senor and Saul Singer. The evidence confirms this anecdotal impression. Israel actually ranks first in the world in venture capital investments as a percentage of GDP. The United States ranks second, and Sweden sixth—ahead of Great Britain and Germany. A 2014 Bloomberg measure of technology density, or the number of high-tech companies as a percentage of all publicly listed companies, provides a similar story. The United States ranks first, Sweden ranks fifth, and Israel tenth. Research and development expenditures as a percentage of GDP move Israel into the top spot, with Sweden in fourth, and the United States in the tenth place.

What is striking about all three countries is that none of them do particularly well in the PISA rankings. Sweden and Israel performed even worse than the United States on the 2012 assessment. With their three subject rankings averaged, they come in twenty-eighth and twenty-ninth, respectively, among the OECD's thirty-four members. What do these countries have in common, other than bad test scores, that could explain their real-world success? A few traits stand out. In all three places, the work culture is non-hierarchical and

merit based. All operate like "young" countries, with energy and dynamism. All three are open societies, happy to let in the world's ideas, goods, and services. And finally, they are all places where people are confident—a characteristic that can actually be measured. The PISA tests don't simply evaluate students' skills; they also ask them questions to determine their levels of confidence—or "self-concept," in the jargon used. Students are asked how good they think they are at, say, mathematics. Despite ranking twenty-seventh and thirtieth in the subject, respectively, American and Israeli students come out right at the top in their belief in their own abilities. Sweden comes in seventh, even though its actual math ranking was twenty-eighth.

I remember first reading about this disparity between achievement and confidence in the early 1990s. At the time, William Bennett, who had served as secretary of education under President Ronald Reagan, described similar results, quipping, "This country is a lot better at teaching self-esteem than it is at teaching math." It's a funny line, but on reflection, there is actually something powerful in the plucky confidence of American, Swedish, and Israeli students. It allows them to challenge their elders, start companies, persist when others think they are wrong, and pick themselves up when they fail. Though confidence overstated runs the risk of self-delusion, the trait is an essential ingredient for entrepreneurship. In their book *The Triple Package*, Amy Chua and Jed Rubenfeld argue that the best-performing minority groups possess a strange combination of insecurity and confidence. When we consider America's endless concerns about its decline, or Israel's fear for its existence, and then couple these insecurities with the bravado its people display, perhaps we see the same phenomenon writ large.

The relationship between educational test scores and economic performance is a subject of great controversy (and has been caught up in the debate about education reform). Some experts see no correlation at all, while others point to data suggesting the opposite. My own sense is that all things being equal, it obviously helps to have a well-trained population. America's public school system needs many of the reforms being proposed by both Republicans and Democrats to make this more likely. South Korea, Taiwan, Singapore, and now China—with their high rates of growth in recent decades—are living proof of a connection between strong test scores and economic success. But growth and innovation are supported by many factors, some of which are wholly outside the realm of tests and skills.

The United States has a poorly trained labor force in

general, which is a disadvantage. But it makes up for it in several ways. The country has an extremely dynamic and flexible economy, strong rule of law, a good regulatory structure, extraordinary research universities, rich venture-capital firms, and a vibrant entrepreneurial culture. All these ingredients more than make up for middling test scores. Japan, on the other hand, has a superbly trained general population. But it would score poorly on many broader economic and cultural indicators, especially with regard to entrepreneurship and the hierarchy of society. Good test scores are not enough to create the next Google.

America also benefits by being the world's magnet for the very best and brightest. It takes in many immigrants, some of whom are well educated and motivated. Its best performers create new companies, products, and even industries. As Silicon Valley demonstrates, a small number of people can have a big impact on the economy. Scholars Heiner Rindermann and James Thompson have found that the performance of a country's top 5 percent, as measured by IQ, is closely correlated with economic growth. America's top 1 percent intellectually, which works out to over three million people, has an outsized effect on growth, according to Jonathan Wai of Duke University.

In a sense, the United States does an amazing job

given its raw material (a poorly trained labor force), and Japan underperforms despite its amazing raw material (a highly skilled pool of workers). South Korea and Singapore, as well as Switzerland and some northern European countries, do well in both dimensions and have the growth to prove it. The great advantage of their model is that it not only generates strong economic growth for the country but also benefits the median worker. In other words, America has many Bill Gateses and Warren Buffetts and Googles and Facebooks to bring up its averages. But top performers and a handful of technology behemoths do not translate into rising incomes for most Americans. For that, the East Asian–northern European model of good education *for all* is crucial. The French economist Thomas Piketty is famous for arguing that capitalism in its essence produces inequality and for advocating higher taxes to ameliorate the problem. But in his treatise *Capital in the Twenty-First Century*, Piketty acknowledges that the best approach to reducing inequality in the long run is widening access to good education. "Over a long period of time," he writes, "the main force in favor of greater equality has been the diffusion of knowledge and skills."

East Asia's economic success has led many to want to emulate its educational system. But as with Amer-

ica, Asian growth might be explained more fundamentally by other factors—like hard work. Again, results from PISA 2012 serve as evidence. On average, students in Shanghai performed better than all their international peers, and were found to be two years ahead of even the best-performing entry from the United States, Massachusetts. What is the secret formula that explains Shanghai's superior performance? Does it teach new math? Old math? Chinese math? The answer might be simpler. U.S. Secretary of Education Arne Duncan has estimated that Chinese students spend 25 to 30 percent longer a year in school than their American counterparts. By the age of fifteen, when the test is taken, students have been at school for about ten years. So, with the number of school days in the United States set at 180 each year, a fifteen-year-old student in Shanghai will have attended school for what amounts to roughly two to three more academic years than a fifteen-year-old in Massachusetts. They're two years ahead in math because they've taken at least two more years of math! It's not Chinese genes, not a better system, not a magic formula—just more work. If Malcolm Gladwell is right when he says that spending ten thousand hours in practice helps you gain proficiency in an area, East Asians are going to reach that goal much

faster than Americans, no matter what the mode of instruction is.

Americans should be careful before they try to mimic Asian educational systems, which are still oriented around memorization and test taking. I went through that kind of system and it's not conducive to thinking, problem solving, or creativity. The founder of China's Internet behemoth Alibaba, Jack Ma, gave a speech recently in which he asked why the Chinese were not as innovative as Americans and Europeans. His answer was that the Chinese educational system teaches the basics very well, but it does not nourish a person's complete intelligence and creativity. It needs to allow people to range freely, experiment, and enjoy themselves while learning. "[Innovations] will only come regularly if we rethink our culture . . . and our sports," he said. "Many painters learn by having fun, many works [of art and literature] are the products of having fun. So, our entrepreneurs need to learn to have fun, too."

The Asian system does teach you to work hard, to retain knowledge for tests, and to perform under pressure—all of which are valuable skills. That may be the simple problem in the United States today—people are working less at school. (This is true of the country in general, not of its best-performing high schools. That said, even among the latter, the academic year is

much shorter than almost anywhere else in the world.) And American universities today have become less demanding along many dimensions. Grade inflation is just one metric. A 2010 research paper found that the average number of hours college students spend studying outside the classroom a week declined from forty in 1961 to twenty-seven in 2003.

An important new study drew on survey data, transcripts, and a learning assessment to answer the question of what high-quality American colleges teach their students. The answer is stunning: not very much. Richard Arum and Josipa Roksa, the authors of *Academically Adrift*, summarize their findings succinctly:

> Large numbers of four-year college students experience only limited academic demands, invest only modest levels of effort, and demonstrate limited or no growth on an objective measure of critical thinking, complex reasoning, and written communication. Fifty percent of sophomores in our sample reported that they had not taken a single course the prior semester that required more than twenty pages of writing over the course of the semester; one-third did not take a single course the prior semester that required on average even more than 40 pages of reading per week. Students in our sample reported studying on average only 12 hours per week during their sophomore year, one third of which was spent studying with peers. Even more alarming, 37 percent dedicated five or fewer hours per week to studying alone. These patterns persisted through the senior year and are broadly consistent with findings on academic engagement from other studies. These findings also should be considered in the context of empirical evidence documenting large declines over recent decades in the number of hours full-time college students spend studying.

And then there is the industry of "amateur" sports, which consumes a massive amount of time, money, and attention. Many large universities have become multi-million-dollar sports franchises with small educational institutions attached to them. Some of these sports, football most clearly, have the effect of systematically damaging the brains of the students. Yet as Malcolm Gladwell has pointed out, institutions that are supposedly dedicated to enhancing the cerebral capacity of their students continue to promote, celebrate, and profit from these activities. The idea of merit and the discipline of academic work are undermined as a result.

In many colleges, the subjects that often define the liberal arts—the core humanities—have in particular become less structured and demanding. That might be why employers have become more suspicious of

majors like English and history. The social sciences, by contrast, have increased in popularity among students and in credibility with employers. They remain somewhat rigorous, representing a midpoint of sorts between the humanities and the sciences. It is the rigor and discipline of a science degree that might impress employers the most, not the specific subject matter. Employers know that a physics major is not likely to use much quantum mechanics in a job involving trading commodities. My brother graduated summa cum laude from college with a degree in math and then went into high finance on Wall Street—supposedly a field in which numbers matter. He felt that his undergraduate major gave him no technical advantage over a humanities major who could do basic arithmetic.

An excessively loose structure, diminishing work levels, and low standards—these are flaws in the implementation of a liberal education, not characteristics of it. The solution is not that people need to major in marketing in college, but that their liberal education should be more structured and demanding. Majors should have some required sequence of basic courses, as in economics. That would be the best preparation for better jobs and stronger careers. Many firms look favorably on college athletes because they know that

athletes have the discipline and habits that go along with regular, long training and practice sessions. If you want to succeed in life, most often you need to put in the hours, develop good habits, work well with others, and get lucky. That is true whether you study English, physics, history, engineering, or business.

In the late 1980s, at the peak of the belief—or fear—that Japan was going to become the world's largest economy, its most innovative country, and the most dynamic society, the journalist James Fallows spent several years there to examine how the United States might confront competition from the "rising sun." He came to the conclusion that the best strategy was not to try to become like the Japanese—that is, not to create a society grounded in self-sacrifice, all-powerful government mandarins, and massive industrial policy. The answer was, as the title of his book indicates, to be *More Like Us*. That meant emphasizing the distinctive strengths of the United States—its openness, innovation, decentralization, laissez-faire attitude, and entrepreneurial culture—but to do so even better than in the past. The same might be true in this case. The solution to the problems of a liberal education is more—and better—liberal education.

of American College and University Grading, 1940–2009," *Teachers College Record* 114, no. 7 (2012): 1–23.

64 portion of all grades: Brittney L. Moraski, "Report: Grade Inflation Persists," *Harvard Crimson*, May 9, 2007; Matthew Q. Clarida and Nicholas P. Fandos, "Substantiating Fears of Grade Inflation, Dean Says Median Grade at Harvard College is A–, Most Common Grade is A," *Harvard Crimson*, Dec. 4, 2013.

65 "a material universe": Anthony Kronman, *Education's End: Why Our Universities and Colleges Have Given Up on the Meaning of Life* (New Haven, CT: Yale University Press, 2007), 66.

65 "The Two Cultures": C. P. Snow, *The Two Cultures and the Scientific Revolution* (New York: Cambridge University Press, 1961).

65 "mutual incomprehension": Ibid., 15–16.

66 "A good many times": Ibid., 16.

66 In 2003, Lawrence Summers: Lawrence H. Summers, "Remarks of President Lawrence H. Summers at the Massachusetts Life Sciences Summit" (speech at the Massachusetts Life Sciences Summit, Boston, MA, Sept. 12, 2003), available at http://www.harvard.edu/president/speeches/summers_2003/lifesci.php.

66 Former Princeton president Shirley Tilghman: Shirley M. Tilghman, "The Future of Science Education in the Liberal Arts College" (speech at Presidents Institute, Council of Independent Colleges, Marco Island, FL, Jan. 5, 2010), available at http://www.princeton.edu/president/tilghman/speeches/20100105/.

67 In 2011, Yale University: Yale-NUS College, "Yale-NUS College Welcomes Inaugural Class Exceeding 150 Students," June 6, 2013, available at http://www.yale-nus.edu.sg/newsroom/yale-nus-college-welcomes-inaugural-class-exceeding-150-students/.

68 In April 2013, a committee of this new enterprise: Yale-NUS College, *Yale-NUS College*. Since the planning stages of Yale-NUS in 2010, some Yale professors and lecturers have raised concerns about a lack of civil liberties in Singapore. See, e.g., Jim Sleeper, "Liberal Education in Authoritarian Places," *New York Times*, Aug. 31, 2013.

69 greatest innovation: Yale-NUS College, *Yale-NUS College*, 45–47.

71 In 1852, Cardinal Newman wrote: John Henry Newman, "Knowledge Its Own End," in *The Idea of a University* (London: Longmans, Green, 1907), 101–102, available at http://newmanreader.org/works/idea/discourse5.html.

71 "What is the earthly use": A. Bartlett Giamatti, "The Earthly Use of a Liberal Education," in *A Free and Ordered Space: The Real World of the University* (New York: W. W. Norton, 1990), 118–126.

3: Learning to Think

74 Bezos insists: Adam Lashinsky, "Amazon's Jeff Bezos: The Ultimate Disrupter," *Fortune*, Nov. 16, 2012. Also see Brad Stone, *The Everything Store: Jeff Bezos and the Digital Age* (New York: Little, Brown, 2013).

74 "Full sentences are harder": Lashinsky, "Amazon's Jeff Bezos."

74 "the firm I led": Norman Augustine, "One Cannot Live by Equations Alone: Education for Life and Work in

the Twenty-First Century," *Liberal Education* 99, no. 2 (Spring 2013).

75 "articulate communication": Yale-NUS College, *Yale-NUS College: A New Community of Learning, a Report Submitted by the Inaugural Curriculum Committee of Yale-NUS College* (New Haven, CT, April 2013), 25–29, available at http://www.yale-nus.edu.sg/wp-content/uploads/2013/09/Yale-NUS-College-Curriculum-Report.pdf.

77 "Conversation": A. Whitney Griswold, "On Conversation," in *Liberal Education and the Democratic Ideal: And Other Essays* (New Haven, CT: Yale University Press, 1962), 68–69.

77 "outside of the book-knowledge": Alfred North Whitehead quoted in ibid.

79 "that will help them get ready": Drew Faust quoted in Libby A. Nelson, "Gainful Employment Negotiations Wrap Up—DOJ Drops Voucher Suit—Harvard President Talks Quality, Value," *Politico*, Nov. 20, 2013.

79 Howard Gardner: Howard Gardner, *The Disciplined Mind: Beyond Facts and Standardized Tests, the K–12 Education That Every Child Deserves* (New York: Penguin, 2000).

79 "There is a joke": Ibid., 102–103.

79 Thomas Cech: Thomas R. Cech, "Science at Liberal Arts Colleges: A Better Education?" *Daedalus* 128, no. 1 (Winter 1999): 209–210. Parts of Cech's article are also quoted in Shirley M. Tilghman, "The Future of Science Education in the Liberal Arts College" (speech at Presidents Institute, Council of Independent Colleges, Marco Island, FL, Jan. 5, 2010).

80 Gardner argues: Gardner, *Disciplined Mind*, 126.

80 point of education: See the comparison Gardner draws between his views on education and those of E. D. Hirsch, an educator and proponent of "cultural literacy," in *Disciplined Mind*, 252–260.

81 "it borders on malpractice": Ibid., 260.

82 "it is in Apple's DNA": Steve Jobs quoted in Tim Carmody, "Without Jobs as CEO, Who Speaks for the Arts at Apple?" *Wired*, Aug. 29, 2011.

82 He studied ancient Greek: On Zuckerberg's interest in the classics, see Jose Antonio Vargas, "The Face of Facebook," *New Yorker*, Sept. 20, 2010.

83 "as much psychology": Mark Zuckerberg quoted in Chase Larson, "Mark Zuckerberg Speaks at BYU, Calls Facebook 'as much psychology and sociology as it is technology,' " *Deseret News*, Mar. 25, 2011.

83 "Knowledge Economy as we know it": Bruce Nussbaum, "Get Creative!" *Bloomberg Businessweek*, July 31, 2005.

84 "human tasks": David H. Autor, "Polanyi's Paradox and the Shape of Employment Growth" (paper draft dated Aug. 11, 2014, prepared for the Federal Reserve Bank of Kansas City symposium at Jackson Hole, WY, Aug. 21–23, 2014), available at http://www.kc.frb.org/publicat/sympos/2014/093014.pdf. Also see Fareed Zakaria, "How to Restore the American Dream," *Time*, Oct. 21, 2010.

85 *Fast Company* article: Anya Kamenetz, "Why Education without Creativity Isn't Enough," *Fast Company*, Sept. 14, 2011.

85 Vinod Khosla: Vinod Khosla (co-founder, Sun Microsystems), in discussion with the author, Sept. 9, 2014.

86 2012 industry report: Michael Masnick and Michael Ho, *The Sky Is Rising: A Detailed Look at the State of the Entertainment Industry* (Floor64, Redwood City, CA,

Jan. 2012), available at https://www.techdirt.com/skyisrising/.

87 experience of Dr. Irwin Braverman: See Christine DiGrazia, "Yale's Life-or-Death Course in Art Criticism," *New York Times*, May 19, 2002; and Holly Finn, "How to End the Age of Inattention," *Wall Street Journal*, June 1, 2012.

88 In 2013, the American Association of Colleges and Universities: *It Takes More Than a Major: Employer Priorities for College Learning and Student Success* (Washington, DC: Association of American Colleges and Universities and Hart Research Associates, 2013). The definition of *liberal education* read to survey participants was as follows: "This approach to a college education provides both broad knowledge in a variety of areas of study and knowledge in a specific major or field of interest. It also helps students develop a sense of social responsibility, as well as intellectual and practical skills that span all areas of study, such as communication, analytical, and problem-solving skills, and a demonstrated ability to apply knowledge and skills in real-world settings."

88 one recent study: Joan Burrelli, Alan Rapoport, and Rolf Lehming, "Baccalaureate Origins of S&E Doctorate Recipients" (InfoBrief, NSF 08–311, National Science Foundation, Division of Resources Statistics, Arlington, VA, July 2008), available at http://www.nsf.gov/statistics/infbrief/nsf08311/. Also see Thomas R. Cech, "Science at Liberal Arts Colleges: A Better Education?" *Daedalus* 128, no. 1 (Winter 1999): 195–216.

89 "So what does business need": Augustine, "One Cannot Live by Equations Alone."

90 "Get a liberal arts degree": Edgar M. Bronfman, "Business and the Liberal Arts," *Inside Higher Ed*, Oct. 17, 2013.

91 first-ever survey of the skills: Organisation for Economic Co-operation and Development, *OECD Skills Outlook 2013: First Results from the Survey of Adult Skills* (OECD Publishing, 2013).

91 most recent edition of the test: Organisation for Economic Co-operation and Development, *PISA 2012 Results: What Students Known and Can Do—Student Performance in Mathematics, Reading and Science* (Volume I, Revised edition, February 2014) (OECD Publishing, 2014).

91 United States has never performed especially well: See Elliott A. Medrich and Jeanne E. Griffith, *International Mathematics and Science Assessment: What Have We Learned?* (Washington, DC: U.S. Department of Education, National Center for Education Statistics, Feb. 1992), available at http://nces.ed.gov/pubs92/92011.pdf.

92 On average: Diane Ravitch, *Reign of Error: The Hoax of the Privatization Movement and the Danger to America's Public Schools* (New York: Knopf, 2013), 65. Ravitch makes the same point about historically poor American performance on international assessments, but she uses it as evidence that the U.S. education system does not require the kind of reforms now proposed by many, including the George W. Bush and Obama administrations. I would tend to disagree with that conclusion.

92 most recent assessment in the series: U.S. Department of Education, National Center for Education Statistics, Trends in International Mathematics and Sci-

ence (TIMSS), available at http://nces.ed.gov/timss/ (accessed Aug. 13, 2014).

92 United States spends more per capita: Organisation for Economic Co-operation and Development, *Education at a Glance 2014: OECD Indicators* (OECD Publishing, 2014), 204.

93 "We both have meritocracies": Tharman Shanmugaratnam quoted in Fareed Zakaria, "We All Have a Lot to Learn," *Newsweek*, Jan. 8, 2006. This quote also appeared in my book *The Post-American World* (New York: W. W. Norton, 2008).

93 It's not just Singapore: For more on the growing interest in the liberal arts in Asia, including the examples in this paragraph, see Yale-NUS College, *Yale-NUS College*, 14–22.

95 Israel actually ranks first: Organisation for Economic Co-operation and Development, *Entrepreneurship at a Glance* (OECD Publishing, 2014), 91. Also see the extremely interesting book by Dan Senor and Saul Singer, *Start-up Nation: The Story of Israel's Economic Miracle* (New York: Twelve, 2009).

95 2014 Bloomberg measure of technology density: "Most Innovative in the World 2014: Economies," *Bloomberg*, at http://www.bloomberg.com/visual-data/best-and-worst/most-innovative-in-the-world-2014-economies (accessed July 28, 2014).

95 Sweden and Israel performed: Organisation for Economic Co-operation and Development, *PISA 2012 Results*.

96 PISA tests don't simply evaluate students' skills: Organisation for Economic Co-operation and Development, *PISA 2012 Results: Ready to Learn: Students' Engagement, Drive and Self-Beliefs* (Volume III) (OECD Publishing, 2013). PISA measured mathematics self-concept by asking students whether they agreed or disagreed with five statements, including "I learn mathematics quickly" and "I am just not good at mathematics." Table III.4.2a (p. 304) provides a country-by-country breakdown of the percentage of students indicating self-concept for each of the five questions. The overall ranking here was calculated by averaging the five separate rankings of countries by percentage.

96 "This country": William Bennett, *The De-Valuing of America: The Fight for Our Culture and Our Children* (New York: Summit Books, 1992), 42–43.

97 their book *The Triple Package*: Amy Chua and Jed Rubenfeld, *The Triple Package: How Three Unlikely Traits Explain the Rise and Fall of Cultural Groups in America* (New York: Penguin, 2014).

97 Some experts see no correlation: See, e.g., Keith Baker, "Are International Tests Worth Anything?" *Phi Delta Kappan* 89, no. 2 (Oct. 2007): 101–104.

97 while others point to data: See, e.g., Eric A. Hanushek and Ludger Woessmann, *The High Cost of Low Educational Performance: The Long-Run Impact of Improving PISA Outcomes* (OECD Publishing, 2010).

98 Scholars: Heiner Rindermann and James Thompson, "Cognitive Capitalism: The Effect of Cognitive Ability on Wealth, as Mediated through Scientific Achievement and Economic Freedom," *Psychological Science* 22, no. 6 (June 2011): 754–763.

98 America's top 1 percent intellectually: Jonathan Wai, "Of Brainiacs and Billionaires," *Psychology Today*, July 3, 2012.

99 "Over a long period of time": Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, MA: Belknap Press, 2014), 22.

100 On average, students in Shanghai: Bill Chappell, "U.S. Students Slide in Global Ranking on Math, Reading, Science," National Public Radio, Dec. 3, 2013, available at http://www.npr.org/blogs/thetwoway/2013/12/03/248329823/u-s-high-school-students-slide-in-math-reading-science.

100 U.S. Secretary of Education Arne Duncan: House Education and Labor Committee, *The Obama Administration's Education Agenda: Hearing before the Committee on Education and Labor*, 111th Cong. (May 20, 2009) (statement of Arne Duncan, Secretary of Education of the United States), 24, also available at http://votesmart.org/public-statement/427845/hearing-of-house-education-and-labor-committee-the-obama-administrations-education-agenda#.VCQ5UWRdVy8.

100 If Malcolm Gladwell is right: Malcolm Gladwell, *Outliers: The Story of Success* (New York: Little, Brown, 2008).

101 Jack Ma: C. Custer, "Jack Ma Explains Why China's Education System Fails to Produce Innovators," *Tech in Asia*, Dec. 9, 2014, available at https://www.techinasia.com/jack-ma-explains-chinas-education-system-fails-produce-innovators/.

101 academic year is much shorter: This has been the case for decades. *A Nation at Risk: The Imperative for Educational Reform* (Washington, DC: National Commission on Excellence in Education, 1983)—an influential report on the state of American education released under President Ronald Reagan—recommended that school districts and state legislatures "strongly consider" increasing the length of the school year to between 200 and 220 days, in line with many other industrialized nations. There is some dispute, however, over how the American school year compares with school years in other countries. See, e.g., Jim Hull and Mandy Newport, "Time in School: How Does the U.S. Compare?" Center for Public Education, Dec. 2011, available at http://www.centerforpubliceducation.org/Main-Menu/Organizing-a-school/Time-in-school-How-does-the-US-compare.

102 2010 research paper: Philip S. Babcock and Mindy Marks, "The Falling Time Cost of College: Evidence from Half a Century of Time Use Data" (National Bureau of Economic Research Working Paper No. 15954, Apr. 2010), available at http://www.nber.org/papers/w15954.

102 important new study: Richard Arum and Josipa Roksa, *Academically Adrift: Limited Learning on College Campuses* (Chicago: University of Chicago Press, 2010).

102 "Large numbers of four-year college students": "Frequently Asked Questions about *Academically Adrift*," Learning in Higher Ed, Social Science Research Council, at http://highered.ssrc.org/publications/academically-adrift/frequently-asked-questions/ (accessed Sept. 1, 2014).

103 Malcolm Gladwell: Malcolm Gladwell, interview by Fareed Zakaria, *Fareed Zakaria GPS*, CNN, July 21, 2013.

105 In late 1980s, at the peak of the belief: James Fallows, *More Like Us: Making America Great Again* (Boston: Houghton Mifflin, 1989).

In Defense of a Liberal Education

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W. W. Norton & Company
Independent Publishers Since 1923
New York • London

Printed in the United States of America
First published as a Norton paperback 2016

Manufacturing by RR Donnelley
Production manager: Julia Druskin

Library of Congress Cataloging-in-Publication Data

Zakaria, Fareed.
In defense of a liberal education / Fareed Zakaria.
pages cm
Includes bibliographical references.
ISBN 978-0-393-24768-8 (hardcover)
1. Education, Humanistic. I. Title.
LC1011.Z34 2015
370.11'2—dc23
2014043268

ISBN 978-0-393-35234-4 pbk.

W. W. Norton & Company, Inc.
500 Fifth Avenue, New York, N.Y. 10110
www.wwnorton.com

W. W. Norton & Company Ltd.
Castle House, 75/76 Wells Street, London W1T 3QT

1 2 3 4 5 6 7 8 9 0

For my children,
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