

Conclusion

*Future Ready: Preparing Young People
for Tomorrow's World*

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Like most ethnographic inquiries, our fieldwork at Freeway High School generated more questions than answers. In the pages of this book we have presented only a small sample of the data, stories, and profiles collected from our study. Still, we think that the accounts and analysis offer an in-depth and even unique perspective on the life of a school that typifies many of the transformations that are under way nationwide.

Freeway is similar to a growing number of schools in the United States in several ways. First, the school has a majority-minority student population. Second, it suffers from deeply entrenched racial academic achievement gaps. Finally, Freeway struggles to prepare its students for postsecondary education and life beyond high school. From our perspective, the teachers, administrators, parents, and certainly students at Freeway labored to build better futures. But they did so in the face of stiff circumstances—social and spatial isolation, economic inequality, and resource-constrained schools and families—not of their own making.

Freeway makes for an interesting case study precisely because it illuminates one of the most urgent challenges facing the United States today: preparing the most diverse student population in the nation's history for a world marked by rapid social, technological, and economic change. In 2000 whites made up 59 percent of the students enrolled in U.S. public schools compared with 17 percent for Latinos.¹ By 2014 white enrollment had decreased to 50 percent, whereas Latino enrollment had increased to 25 percent.² Black enrollment between 2000 and 2014 remained basically unchanged, going from 17 to 16 percent. Historically, youth from Latino and African American mixed-race households have

been referred to as minorities, but they now represent the majority of school-aged children and teens in the United States.³ Consequently, the societal stakes for not properly educating them are higher than ever.

If it is true that the road to building better social, civic, and economic futures includes creating more equitable educational outcomes, then schools like Freeway must become a national priority. Ask any K–12 educator what the goal of education is today, and you are likely to hear some version of this: “Upon graduation, our students should be career ready or college ready.” During our time at Freeway we constantly heard the “career or college ready” mantra. This is the twenty-first-century battle cry in education. However, just a cursory glance at education data suggests that a majority of U.S. students, especially Latino, African American, and lower-income, are not college ready. Moreover, as we reflect on our fieldwork we believe that schools should rethink what it means to be career ready. In fact, the very notion of career ready strikes us as increasingly anachronistic in a world in which the idea of a career as we understood it in the twentieth century seems less and less applicable in the twenty-first century.

We suggest that, rather than develop career-ready skills and dispositions, schools begin to think about what it means to be “future ready.” “Career ready” implies preparing students for a world in which work is stable, linear, and secure. Alternatively, “future ready” implies preparing students for a world in which work is in flux, non-linear, and insecure. In the economy of tomorrow, jobs will be anything but stable and predictable, which means that workers must learn to be flexible earners *and* flexible learners. And while some students will have access to the schools and learning opportunities that will prepare them for a rapidly evolving society and economy, most will not. Equipping our most vulnerable schools with the resources to develop future-ready students must be a prominent component of any effort to make our schools more relevant.

The College Readiness Crisis

Midway through the fall term, Freeway’s principal, Mr. Gomez, summoned all of the seniors and their teachers to a special assembly. He warned them that more than half of the senior class was in danger of not

passing their final year of high school. A number of students were not submitting homework or attending their classes. Senioritis had come early at Freeway, and now the school was potentially facing what could only be described as a serious embarrassment. Improving the high school graduation rates of lower-income students has become a national goal. It was, arguably, the main goal at Freeway. School officials engaged in a variety of creative techniques to make sure that students who suffered from chronic absenteeism or failed to submit homework stayed on track for graduation.

The National Center for Education Statistics reports that the graduation rate in 2014-15 for American Indian/Alaska Native (72 percent), black (75 percent), and Hispanic (78 percent) students was below the national average of 83 percent.⁴ By contrast, the graduation rates for Asian/Pacific Islander (90) and white (88 percent) were above the national average.⁵ Texas was the only state in which the graduation rate for black students was higher than the overall national rate. In addition, the percentage of Latino students graduating high school in Texas has also increased sharply.⁶ Still, the state's success in driving up high school graduation rates has not translated to the postsecondary level, especially among students from lower-income households. When State District Court judge John Dietz of Austin ruled that the manner in which Texas funds public education is unconstitutional, he also issued this harsh rebuke of the educational inequities in the state: "An alarming percentage of Texas students graduate high school without the necessary knowledge and skills to perform well in college."⁷

There is a growing recognition that the relaxation of standards and the new policies that make it easier for students to overcome chronic absenteeism, poor literacy skills, and less than stellar academic work to meet graduation requirements may be coming at a cost: the production of a generation of graduates who are not adequately prepared for postsecondary education or the rapidly evolving workforce.

According to the state's metrics, the vast majority of Latino and black graduates at Freeway are not adequately prepared for college. Take two measures—enrollment in AP courses and college readiness.⁸ Roughly 40 percent of Asian American and 36 percent of white students were enrolled and received credit in at least one AP course. By comparison, 21 percent of Latino and 20 percent of black students were enrolled in

academically advanced classes. A similarly low percentage of economically disadvantaged students (21 percent) and English language learners (19 percent) were enrolled in Freeway's most rigorous courses. The enrollment disparities in advanced coursetaking drive the racial and ethnic disparities in college-readiness.

According to the Texas Education Agency, in order to be a college-ready graduate, a student must have met or exceeded the college-ready criteria in the state assessment exit exam or the SAT or ACT test in English language arts or mathematics. Among white and Asian graduates, 71 percent and 66 percent, respectively, met this college-ready graduate standard. The percentages of Latino (39 percent) and black (38 percent) college-ready graduates were considerably lower. Less than half of the students, 43 percent, designated by the district as "economically disadvantaged" were college-ready graduates. Students classified as English language learners were the least likely (11 percent) to be college ready by graduation.⁹

The education story in the United States is remarkably complex. For example, since 2000 the rate of black and Latino enrollment in college has actually increased more than that of whites.¹⁰ This is partially attributable to the fact that more black and Latino students are graduating high school than ever before. Also, black and Latino students represent a greater share of the student-age population than at any other time in U.S. history. However, growth in college enrollment has not closed the college degree attainment gap.¹¹

If enrolling black and Latino students in college has been a challenge, earning a degree once enrolled in college has been even more daunting. Despite the greater number of black and Latino students enrolling in college, they are much less likely than their white and Asian counterparts to graduate. The National Center for Education Statistics found that 62 percent of whites earned a bachelor's degree within six years of enrolling in college. By comparison, 51 percent of Latinos and 40 percent of blacks earned a bachelor's degree within six years of enrollment.¹² Even though record high numbers are entering college, black and Latino students are three times more likely to leave college without a degree in hand than their white or Asian counterparts.

Along with getting more underrepresented students into college, an equal challenge is getting them out with the credentials and skills

to navigate our rapidly evolving knowledge economy. But even when young African Americans earn a college degree, they are more likely than their white counterparts to be unemployed or underemployed.¹³

The High Cost of the College Readiness and Affordability Crisis

Virtually all of the students that participated in the in-depth portion of our study had no intentions of attending a four-year college. And in our informal conversations with other students, it was clear that a significant portion of the general track students—the majority of Freeway students—were not planning to enroll in a postsecondary institution. There were two primary reasons, academic and financial, why a four-year degree was not a viable option for many Freeway students.

A great number of Freeway students were simply not prepared academically for college. In many instances they lacked the proper course work, grades, and academic training to succeed at the collegiate level. College readiness begins long before students enter high school and reflects the extent to which both schools and the home environment can supply the resources that support the development of a college-going disposition. As we note in chapter five it is likely that a majority of the students who enter Freeway fell behind the college readiness standards as early as the elementary and middle school years. The state's college readiness metrics noted above suggest that getting these students college ready in the four years of high school is a formidable task.

Most of the participants in the in-depth portion of our study were general track students. The general track courses met the state's requirement for graduation but fell short of what was expected for college preparation. Some of the students that we followed contended with alienation from school and struggled to meet graduation requirements. But many also had college potential. Students such as Diego and Sergio were clearly capable of doing college preparatory work, but declined. As a result, their academic training was not oriented to enrolling in a four-year college.

Affordability was another main reason Freeway students cited for not attending a four-year college.¹⁴ Many students explained that their families simply could not afford the high cost of a four-year college. Minh, a precocious student from a Vietnamese immigrant household,

was strongly committed to enrolling in a four-year college, but his dad discouraged him largely due to concerns about cost. Even though Amina (profiled in chapters two and seven) was admitted to a four-year college, she elected not to enroll, citing concerns about financial and familial instability. Nelson, a young African American student at Freeway, experienced firsthand the steep economic barriers lower-income families face to send their children to college. His story is revealing.

Nelson was one of the more promising students that we met during our time at Freeway. His big smile was matched only by his ambitions to become a filmmaker. Nelson was a founding member of the digital media club at Freeway. The after-school club was an alternative space for students like Nelson who otherwise struggled in school. His engagement in the digital media club presented the opportunity to craft a distinct identity and practice his digital media making skills, and provided the motivation to stay in school and earn his diploma.

In addition to enrolling in technology classes and participating in the activities available through the digital media club, Nelson studied online tutorials and films to sharpen his technical skills and creative vision. The music library on his laptop was filled with musical scores from his favorite films. After graduating from high school, Nelson created his own media production company, began making short films, and built a social media presence. The short films that he made were smart, expertly edited, and wonderfully immersive. Members of our research team were impressed by the quality of his storytelling. Nelson had real talent.

But Nelson did not have strong grades, which blocked a fluid transition to college after graduation. Like most high school only graduates, Nelson struggled to find employment.¹⁵ Still, he continued to keep his passion for the digital media arts and film alive. For example, he volunteered to be a mentor for the students who participated in Freeway's CAP (see chapter five for a description of the project). Serving as a mentor kept his mind and creative inclinations engaged. During this period Nelson submitted one of his short films to a prestigious European student film festival competition. When the film was accepted, he raised money to help finance his trip to Europe. The experience confirmed his desire to make films.

Nelson's grades were not necessarily competitive, but his portfolio of creative work offered a glimpse into his potential as a filmmaker

and helped earn him admission into a film school in Chicago. Nelson's friends and family were ecstatic. He was set to become the first member in his family to attend a four-year college. Attending film school in Chicago promised to expand his social network, introduce him to new opportunities, and strengthen his skills as a media maker and storyteller. A couple of weeks before the start of classes, Nelson announced via Twitter that he would not be moving to Chicago to pursue the study of film. The high cost of tuition was simply too prohibitive and the amount of loans too debilitating. Several of his friends expressed collective grief via Twitter that offered some degree of solace. Roughly one year later, Nelson maintained dreams of making digital media content for a living but struggled to secure full-time employment as a high school graduate.

There are tens of thousands of stories like Nelson's, and they are spurring concern that, as the price tag of a four-year degree continues to escalate, many students are simply priced out of the college-going market and, consequently, a chance to earn the education and credentialing necessary in a skills-based economy. While the high cost of college kept Nelson from enrolling in film school, the cost of not going extended beyond his own personal circumstances. There was, we argue, a cost to his community too.

Many of Nelson's peers at Freeway knew that he had been admitted to a four-year college. He was a source of inspiration, an example that someone with a modest academic record could still gain admission to a four-year college. It is easy to overlook how an act like going to college is a social contagion.¹⁶ Many students go to college partly because it is a norm, something that family members, teachers, and peers expect. Nelson was not the only one to suffer when he decided that college was too expensive. Freeway and his community suffered also as his inability to afford college reproduced a devastating norm—not pursuing a postsecondary credential—that undermines the social and economic security of communities like the one Nelson belonged to.

Educational Equity: The College Wage Premium

The racial disparities in college readiness and completion have serious social and economic implications. In an economy in which high levels of educational attainment closely correspond to meaningful employment,

the under-education of so many Latino, African American, and lower-income youth poses long-term concerns. A report by the Pew Research Center titled *The Rising Cost of Not Going to College* presents data that strongly make the case that the current educational achievement gaps in the United States are the civil rights issue of our time.¹⁷ The college readiness gap is steadily rolling back many of the social, educational, and economic gains made by Latino and African Americans in the period that followed the struggle for civil and economic rights in the 1950s, 1960s, and 1970s.

While college graduates from previous generations have long faced economic futures that were brighter than those of their counterparts who did not attend college, the employment and economic well-being gap between graduates and nongraduates is greater today than at any other time in U.S. history. According to the Pew Research Center, the pay gap between a college graduate and someone with just a high school diploma was \$7,449 in 1965. By 2014 the pay gap between these two groups was \$17,500.

On every measure of economic performance and well-being, college-educated millennials far outperform their non-college-educated counterparts. For example, when compared with their non-college-educated counterparts, college-educated millennials earn more, are significantly more likely to be employed, and are far less likely to live in poverty. Economic inequality among millennials is fueled in large part by unequal educational outcomes and, more specifically, the attainment of a college degree. This is what economists refer to as the “college wage premium.”¹⁸

A key factor in the rising inequality among college-educated and non-college-educated millennials is the declining value of a high school diploma in today’s economy. Whereas the earnings of college graduates have increased over the last half century, the reverse is true for those with only a high school diploma. Rising poverty rates among millennials underscore the diminishing value of having only a high school diploma. Since 1979 poverty rates among twenty-five- to thirty-two-year-olds with only a high school education have tripled.¹⁹ The life chances of persons with only a high school diploma in hand have sharply declined over the last half century.

These trends, from our perspective, raise serious concerns about the kinds of futures the majority of Freeway students are likely to encounter

in their transition to young adulthood without the adequate preparation to earn a postsecondary credential. In the world that students are transitioning into today, having only a high school diploma is an almost certain path to living at or below the nation's poverty line.

From Career Ready to Future Ready

In addition to producing students that are college ready, there is a strong emphasis across the nation to ensure that students are career ready. But the very notion of career readiness seems anachronistic in a world in which the nature of work is undergoing a profound transformation. More specifically, the likelihood of having a “traditional career” is not very good for persons entering the workforce in the twenty-first century. Therefore, we encourage schools to develop students who are future ready rather than career ready. What does it mean to be future ready in today's knowledge-driven economy?

Any valid future-ready curriculum must take a serious look at the economy and society students are transitioning into. It is a world marked by striking changes and uncertainty.

As we have suggested throughout this book, technology is a dominant trope in discourses about the future of learning. In addition to acquiring a wide range of technology—hardware and software—schools are offering a mix of tech-oriented courses including game development, video production, graphic arts, robotics, and computer science. While the massive financial investment in technology is a common practice among schools, the design of curriculum-rich classrooms and learning opportunities that cultivate the skills that are aligned with a steadily evolving knowledge economy remains elusive.²⁰ The main challenge to building a future-ready curriculum is that the skills required for meaningful and sustainable employment are in a constant state of flux. The school-to-work transition has never been more complex than it is today, which makes the work of education and future preparation especially daunting.

No Work or New Work?

Among the many factors that are driving change in the U.S. economy, none is more hotly debated than the presumed impact of technology.

There are, broadly speaking, two competing perspectives. One commonly held view is that technological advances—robots, intelligent machines, and advanced computing—have rendered many jobs obsolete. The other view asserts that technological advances do not eliminate work but rather increase the need for higher-skilled workers.

Human labor, the first perspective asserts, is being replaced by smart machines and, thus, leads to what some call the “post-market” society or “jobless future.”²¹ Martin Ford maintains that steady progress in software automation and predictive algorithms has pushed technology into a new frontier. Computerized technologies are no longer mere tools; they are capable of becoming autonomous workers. Ford maintains that the rising capacity of smart technologies will render a variety of jobs, lower skill and higher skill, obsolete. The tech industry, known for its appetite for disruption, may be provoking the biggest disruption of all—forcing workers across the United States out of the labor market or into lower-skill jobs that place an enormous amount of stress on society and the economy.

A second and competing view is that technological advances will lead to new forms of work rather than the demise of work.²² According to this perspective, new technologies increase the demand for higher-skilled workers who can, for example, design, manage, and secure the operations and performance of smart machines. Writing for *Wired*, Kevin Kelley notes that robots inevitably take over most of the jobs and tasks that humans do, including both manual and cognitive labor.²³ But rather than become idle, humans, Kelley claims, will do what they have always done in the face of technological advances: create new tasks to execute.

In this bold new future, Kelley asserts that “the postindustrial economy will keep expanding, even though most of the work is done by bots, because your task tomorrow will be to find, make, and complete new things to do.” The idea is simple and radical at the same time. To paraphrase Erik Brynjolfsson and Andrew McAfee, humans are not in a race against machines—a race that we would lose—but rather a race with the machines.²⁴

Advocates of this perspective do not fear that smart machines will render humans useless in a soon to arrive jobless future. Rather, the rise of smart machines will forge extraordinary creative, civic, and economic opportunities for those who learn how to work with them. In the current

era of innovation there is a rising premium on the ability to use smart machines to do smart, creative, useful, and novel things.

Perspectives like these illuminate the degree to which the development of innovation skills should matter more than ever for schools seeking to nurture future-ready students. Further, this perspective highlights one of our key claims: the innovation economy is not about technology but rather about the ability to leverage technology and other resources to innovate and intervene in the world in ways that are both original and valuable. Much of the energy and creativity happening across America's innovation hubs involves the smart application of smart technologies. Rather than building the Internet's infrastructure or hardware, innovators are using smart technologies to disrupt the services and products offered in traditional industries such as media, finance, fashion, health, transportation, and education.²⁵ Today's knowledge economy is driven by good ideas, not technology.

Raising the Cognitive Bar

One of the big challenges facing Freeway is helping students develop the skills and disposition that matter most in a society and economy undergoing rapid change. Most economists believe that one of the more significant impacts of technological innovation is the degree to which it increases the demand for skilled laborers. This, more specifically, is called *skill-biased technological change*.²⁶

Claudia Golding and Lawrence Katz find a turning point in the late nineteenth century when technological changes became, generally speaking, skill biased.²⁷ Golding and Katz maintain that the rise in economic inequality over the past three decades is due, in large measure, to a slowing rate of educational attainment that has not kept pace with technological change and the surging demand for more high-skilled workers. They characterize this dynamic as “the race between education and technology.” The most noticeable losers in this race typically resemble the young students who populated the classrooms at Freeway—poor, Latino, black, and immigrant.

As the skill requirements in our rapidly evolving economy are rising, the cognitive bar that schools must meet is also rising. What future-ready skills should schools be cultivating?

Frank Levy and Richard J. Murnane argue that the steady rise of computers has reorganized America's occupational structure.²⁸ More specifically, the growing presence of smart machines in the economy renders a growing inventory of jobs, manual and cognitive, obsolete. Analysts have long maintained that those tasks—manual or cognitive—that are predictable and repetitive and that computers can be programmed to execute by following specific rules will be automated. The tasks, manual or cognitive, that are more insulated from automation require skills like flexibility, complex thinking, solving uncharted problems, managing people, or social interactions.

The rise of smart machines, according to Levy and Murnane, has provoked a new division of labor, one that, broadly speaking, creates two classes of workers: those who can perform valued work in a world filled with computers and those who cannot. From their perspective, schools should be cultivating a repertoire of skills that are difficult for smart machines to perform by themselves.

In addition to expert technical knowledge, what these tasks require is the ability to grapple with novelty and complexity and also see opportunity where others do not. Some skills, no matter what the economy or jobs landscape looks like, are likely best performed by humans. Here we focus on two skills that any future-ready curriculum should be seeking to nourish, what Levy and Murnane refer to as *expert thinking* and *complex communication*.

Expert thinking reflects the ability to identify and solve problems for which there are no routine solutions. One example of expert thinking is pattern recognition. This particular skill reflects the ability of humans to understand the data-driven world around them and, importantly, discern change and distinct patterns. It is one thing for a computer to run algorithms that produce big data capable of mapping the spread of the Ebola virus. It is another thing to be able to recognize and analyze correlations, patterns, and causal insights that understand the geographical, sociological, and biological characteristics of the virus. Humans are better suited to ask the kinds of questions that will strengthen the algorithms' ability to generate data that support human creativity in the form of intervention and proactive problem solving.

Building on the research of Levy and Murnane, economists Brynjolfsson and McAfee posit that the human ability to ask novel questions

will remain highly valuable even in the “second machine age,” a period characterized by rapid computerization and automation.²⁹ Brynjolfsson and McAfee contend that ideation skills are an example of expert thinking, or the ability to grapple with complex problems for which there are no routine solutions. Computers may be powerful tools in the effort to raise money from millions of people distributed across the world, crowdfunding, but are not very good at knowing that they could be used this way. Humans are much more likely to ask “what if?” or “how can we?” Brynjolfsson and McAfee write, “We predict that people who are good at idea creation will continue to have a comparative advantage over digital labor for some time to come, and will find themselves in demand.”³⁰

And then there is what Levy and Murnane call complex communication skills. More generally, communication skills embody the prehistoric inclination among humans to tell stories that give meaning to human experience. In the age of big data, there is growing demand for analysts who can smartly and persuasively interpret the deluge of information generated through rising computing power and massive data networks. Complex communication, according to Levy and Murnane, involves the ability to convey not just information but a particular interpretation of information.³¹ Transforming the world’s information into complex forms of communication via policy, organizational strategy, a compelling ad campaign, or a stirring novel will continue to be an important human skill.

Expert thinking and complex communication involve the ability to grapple with some of the defining features of our time, such as complexity, uncertainty, and diversity. We believe that the knowledge and competencies associated with expert thinking and complex communication skills are poised to grapple with a steadily evolving society and economy. These are future-ready skills—that is, skills that are not simply focused on getting a job today but rather cultivating the competencies and dispositions to effectively navigate the world of tomorrow. But these are also skills that will be the primary domain of those who cultivate a questioning, risk-taking, and innovative disposition. If our fieldwork at Freeway is any indication, our schools are not properly designed, resourced, or incentivized to cultivate the skills that embody future readiness.

The Future of Work

Any future-ready curriculum must reflect a sharp understanding of the society and economy that young people are transitioning into. Levy and Murnane's thesis that the world of work is splitting into two classes—those who work with computers and those who do not—is provocative, but it requires some modifications. Technology is not the only driving force in the future jobs economy. The nation's growing racial and ethnic diversity, economic polarization, and aging population, for example, will have as much of a long-term impact on the economy as any other phenomenon, including technology. This is especially clear when you look at the U.S. Bureau of Labor Statistics (BLS) occupational employment projections over the 2016–2026 period.³² The BLS expects overall occupational employment to increase by 7.4 percent between 2016 and 2026. These five occupational groups are projected to grow even more, according to the BLS:

- Healthcare support occupations (23 percent)
- Personal care and service occupations (18 percent)
- Healthcare practitioners and technical occupations (15 percent)
- Community and social service occupations (14 percent)
- Computer and mathematical occupations (14 percent)

While technology is driving changes in each of these occupational categories, these projections are driven as much by social transformations as they are technological transformations. For example, the much-faster-than-average growth in healthcare-related occupations is shaped by an aging baby-boom population, longer life expectancies, and anticipated increases in chronic diseases that have links to widening social and economic inequality. Despite our fascination with the “new digital economy,” one of the BLS's assertions about the future jobs landscape is eye-opening: “Of the 30 fastest growing detailed occupations, 19 typically require some level of postsecondary for entry.”³³ With the exception of computer and mathematical occupations, most jobs in the fastest-growing occupational categories listed above do not require a four-year college degree, contradicting widespread notions about education and future employment.

The BLS employment projections raise questions about the actual demand for knowledge-based work. Economists Paul Beaudry, David A. Green, and Ben Sand point to employment patterns and wage data that suggest that, after years of steady growth, the demand for cognitive labor began declining around 2000.³⁴ They identify trends that suggest that during this time college graduates began moving out of high-wage occupations and toward lower-paying occupations. Other studies suggest that young college graduates are increasingly more likely than previous generations of college graduates to be underemployed—that is, working in jobs that do not require their college degree.³⁵

In his book *Rise of the Robots*, Martin Ford challenges the basic premise developed by Levy and Murnane that the employment prospects of those with high levels of education will be protected from the rise of smart machines. Ford maintains that the advances in software automation and predictive algorithms are gradually replacing white-collar jobs in a number of sectors, including medicine, journalism, and the law. As the learning and predictive capabilities of these technologies improve, the impact on white-collar workers, Ford argues, will be catastrophic. He writes, “The unfortunate reality is that a great many people will do everything right—at least in terms of pursuing higher education and acquiring skills—and yet still will fail to find a solid foothold in the new economy.”³⁶ Ford points to data that suggest that opportunities for college graduates in the labor market as well as their earnings are already being limited by the ability of advanced technologies to do entry-level, knowledge-based work.³⁷

Further, not all knowledge work is equal or fulfilling, as is evident with the rise of “white collar sweatshops,” precarious white-collar labor, and cognitive stratification.³⁸ While some of the jobs projected to grow between 2016 and 2026 will require advanced cognitive skills that complement smart technologies, most will not. In the United States, virtually all of the major industry job growth in the forthcoming decade will be in service provision industries. Additionally, the organization of the service-base economy into low-skill/low-wage labor and high-skill/high-wage labor suggests that some workers will experience unprecedented economic opportunities and prosperity while others will experience shrinking economic opportunities and uncertainty. The former are the winners and the latter are the losers in what has become a winner-take-all economy.

Sadly, under these conditions a growing share of workers will be losers. Since the start of the Great Recession in 2007, lower-wage occupations have grown at a much faster rate than their mid-wage and higher-wage occupation counterparts.³⁹ The spread between the high-skill workers (e.g., managers, professionals) and low-skill workers (e.g., retail, food preparation) is widening and reflects the acute social and economic inequalities that are a striking feature of the new economy. Daniel Bell's assertions in the 1970s that the coming of a postindustrial society would lead to a revolution not only in the occupational structure in the United States but also in the class structure has come to pass.⁴⁰

Levy and Murnane's thesis about being able to work with smart machines is instructive. However, the reality is that the majority of jobs do not require one to work with smart machines. Moreover, these jobs are likely to be lower-skill and lower-paying jobs that offer few opportunities for upward mobility and economic security.

The bridge to economic opportunity in tomorrow's economy appears especially weak in light of what we witnessed at Freeway and what we surmise may be going on in other schools similarly challenged by social, demographic, and economic change. At Freeway the primary goal was training students well enough to meet the minimum state standards for graduation that have dumbed down education and driven much of the life out of schools.⁴¹ The emphasis on being obedient, compliant, and quiet and memorizing facts runs counter to the skills and dispositions that the current era of innovation demands, such as risk taking, assertiveness, curiosity, and out-of-the-box thinking. At Freeway, the intense pressure to get bodies in seats, cram for state exams, and grapple with state-driven teacher accountability mandates precluded any real opportunity to think about a future beyond simply getting students to the finish line of graduation.

Freeway students were seldom exposed to learning opportunities that cultivated future readiness. Consequently, learning at Freeway rarely involved asking novel questions, solving uncharted problems, or conveying a particular interpretation of information. What kind of future were Freeway students being prepared for?

School was essentially preparing students for a world that no longer exists, an era described by economist Tyler Cowen as "the age of average."⁴² "Average" in this case refers to the period when individuals with

only minimal levels of educational attainment (say, a high school diploma) could still secure meaningful employment, namely, in the middle-skill industrial sector. But as Cowen and others argue, the age of average is over.

Most schools struggle to design curricula and classrooms that engage the decisive shifts driving the new division of labor. The jobs projections over the next two decades, the expanding capacity and impact of smart technologies, and the skill-biased technical change make for a radically different world that demands that schools think and act differently. So much of the schooling at Freeway is premised on the notion that passing students through secondary school and into the workforce is the school's principal task. But the influence of automation and innovation in tomorrow's economy renders schools like Freeway dangerously out of touch with the world its students will encounter upon graduation.

A 2017 report by the McKinsey Global Institute finds that as early as 2030 about one-third of the American workforce may have to find new work as a result of automation. These changes, the report asserts, "imply substantial workplace transformations and changes for all workers."⁴³ McKinsey adds that if historical trends are a guide, 8–9 percent of 2030 labor demand will be in occupations that have not existed before. Some of these new occupations will almost certainly be related to technological transformation (i.e., artificial intelligence) and social transformation (i.e., a more diverse and aging population). One of the big challenges, and the one that we have focused on in this book, is the preparation of young people for a world in which work—what people do and how they do it—will continue to look much different compared with previous decades. This is true for all workers, including human experts and professionals.⁴⁴

Current economic data and future employment projections suggest that the majority of Freeway students will enter a labor market that will offer them few, if any, opportunities for meaningful employment and economic mobility. Young people with only a high school diploma are extremely vulnerable, as their wages and prospects for employment continue to decline. The cost of not being future ready will be extraordinarily high as lower-income and undereducated youth continue to face daunting odds of climbing out of the lower rungs of America's stratified economic order.⁴⁵

Future Ready or Not

If the future of work is at least partially about reimagining the work that we do, an important question emerges: Who is best prepared and positioned to thrive in that future? In other words, who is most likely to be future ready? The question brings schools and the growing educational disparities in the United States squarely into view. Unfortunately, the skills and disposition required for future readiness illuminate the current limitations in education and the crisis that challenges our ability to prepare the nation's most diverse student population in history for a school-to-work transition that is more daunting than ever.

Like many of their peers across the nation, the educators and district leaders at Freeway emphasize the acquisition of technology as an indicator of investing in better learning futures. Our fieldwork suggests that the most urgent challenge in education is not making sure that all students have equal access to technology but rather that all students have equal access to high-quality learning opportunities that prepare them for a world marked by complexity, uncertainty, and diversity. Latino, black, immigrant, and poor youth make up majorities of our school-aged population, and yet they are the least likely to receive a future-ready education. This was certainly the case with the majority of the students at Freeway. Further, many of them did not have plans to attend college after high school. Instead, they intended to go directly into the paid labor force. When we followed up with a sample of these students, their prospects for opportunity were predictable. They struggled to find work that was stable and financially and personally rewarding. For the few who did find employment, it was typically in the sectors associated with retail and food preparation.

We spent more than a year with these students and knew that many of them harbored aspirations of entry into Austin's expanding creative economy. They spent an extraordinary amount of time in school, after school, and with their peers cultivating their interests in digital media and the creative arts. Despite these efforts, pathways to careers in tech and media were simply not accessible to many of them. Freeway students typically suffered from two things. First, most did not have the human capital—that is, the education, training, and experience that typically facilitate entry into high-skilled and creative labor sectors. Second, most

did not have the social capital—that is, the social networks and rich information channels that are also essential to finding good work.⁴⁶

In addition to the skills identified above—expert thinking, ideation, complex communication—schools should labor to cultivate what might be called a “future-oriented disposition.” This includes, for example, the ability to grapple smartly with uncharted problems and leverage technology to do novel things that are responsive to the shifting currents in society. Rather than develop the skills to find a job today, students will be better served cultivating a way of thinking and being that navigates the uncertainties *and* opportunities of tomorrow. Skills like these—design, problem solving, entrepreneurship, civic-mindedness—cannot be overestimated in a world shaped by accelerating changes and uncertainty. Finally, notice anything about these skills? Notably, these are not technology skills; they are thinking skills or skills that require cognitive nuance and the ability to create and apply ideas in novel ways.

Today’s tech- and service-driven economy has been more than a century in the making. A presidential committee assigned by Lyndon B. Johnson in 1964 produced a memo that stated, in part, that the combination of computers and automated self-regulating machines would one day lead to mass unemployment. For more than fifty years social scientists have been examining social and economic trends as they forecast the “coming of postindustrial society,” the reorganization of the occupational structure, and what this all means for the future of work, opportunity, mobility, and equity.⁴⁷ Still, schools have remained largely resistant to or incapable of designing classrooms, curricula, and learning experiences that are aligned with an economy that has developed a strong bias toward those persons that possess the skills to ask novel questions, engage in expert thinking, or master more complex forms of analysis and communication.

This is precisely the challenge that faces Freeway specifically and our nation’s schools more generally. It is not simply that we have been unable to redesign education in alignment with a rapidly evolving world. There is no sustained effort to establish a new paradigm for schooling that effectively recalibrates what it means to be a learner, worker, or citizen in the world today.

As a result of our fieldwork and involvement with the MacArthur Foundation’s Digital Media and Learning initiative, we are frequently

asked what we would recommend to educators. Upon reflection, we would encourage educators to ask themselves these questions: Are we preparing our students to perform tasks in which humans maintain a distinct advantage over intelligent machines? Are we designing learning environments that encourage students to grapple with and solve uncharted problems? Are we training our students to ask novel questions? Are our students being taught to work with data, analyze data, recognize patterns, and interpret them in particular ways? Does our school understand that technology is a tool for solving problems and not the solution?

If the answer to these questions is no, then educators should begin rethinking their learning goals and curriculum. In short, they should begin to think carefully about what it means for students to be future ready.