APOLLO GROUP[SM]

EMPOWERING AMERICA

Reinventing Pathways to College and the Workforce

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$100 Trillion

Long-term economic pay-off for recapturing U.S. educational leadership

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> It's not a skill set deficit. It's a will set deficit. It's principals, school boards, policymakers, unions and CEOs. There's just a huge difference between what we know works and what we dare to actually put to work. If we do that we'll implode the current system.

– Alberto Carvalho,
Superintendent,
Miami-Dade County Public Schools

$154 Billion

Lifetime wages lost to students who dropped out of high school in 2011

43%

High school students met SAT's college and readiness benchmark

70%

Class of 2013 graduated college with debt

21st | U.S. world ranking in high school graduation

> People are being denied access to the American dream because they don't have the skills they need and this is playing out over and over—and more troubling, generation after generation. There's a renewed understanding among colleges and universities that 'change or die' is minted on the coin of the realm.

– Margaret Spellings,
former U.S. Secretary of Education

Fewer than **1 in 10** | Community college students diverted to traditional remedial classes graduate within three years

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121,153,000 | U.S. adults over the age of 25 don't have a college degree

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> If colleges and universities expect something different from K-12 they need to reach out. We [in the private sector] need to be willing to get engaged in new and different ways.

– Maura Banta,
Global Citizenship Initiatives in Education Corporate Citizenship & Corporate Affairs, IBM

Introduction

There is no shortage of compelling statistics when it comes to the state of education in the United States. For example, 77, the percentage of American students who graduated from high school in 1969, a historic high point when we led the industrialized world.

Or, 21, America's current ranking when it comes to high school graduation among advanced nations. Then consider 25th, 17th and 14th: U.S. international rankings in math, science and reading, respectively. Some numbers represent a national crisis in their own right, such as the 7,000 students who drop out of high school daily, adding up to 1.2 million drop-outs each year.

Other figures bring our failures to adapt to the forefront: fewer than one in 10 community college students who take remedial courses graduate within three years.[1]

Last year, Apollo Group added another large number to the discussion. As a result of the leveling off of American educational attainment – a trend that started in the 1980s – we calculated that the U.S. workforce is short more than 100 million years of education. The education achievement gap has cost more than $2.3 trillion in GDP, according to one estimate.

This paper looks more deeply at our nation's "missing years" of education, each represented by a decision not to finish high school, not to enter college, not to stay in college – or a decision not to return.

Taken together, those decisions collectively add up to the most important number in higher education: 121,153,000.

That is, the more than 120 million Americans over the age of 25 who do not have a college or university degree of some kind. Declining U.S. educational performance over the last four decades, combined with changes in American society has put new pressures on educational attainment, precipitating the current college and career readiness crisis. Remedying that crisis will require radical, systemic changes and – most importantly – the will to re-imagine our system of postsecondary education.

The reasons for today's readiness crisis are two-fold. First, while we have made some progress in the past few years, there has been a persistent problem that many graduating high school students are unprepared to attend college in the first place. Second, our system of higher education isn't prepared for the scale of change required to address today's student population and their needs.

American students in the upper half of the income distribution – the ones our educational system was originally designed to serve – still lead the world, ahead of countries like South Korea, Canada and Finland. Repairing the cracks in the educational pipeline will mean focusing time, resources and attention on the students who need it the most: students in the lower half of the income distribution, and in particular those who are returning to higher education after interrupting college, typically for family or financial reasons. This portion of our population, should we succeed in moving them from tax users to taxpayers, could substantially add to the U.S. GDP over their lifetimes.

The current college readiness crisis is not the first experienced by our country. The first readiness crisis occurred as World War II was coming to a close and the G.I. Bill was enacted into law. Despite nearly a half-century of steadily improved high school enrollment, most returning veterans didn't have a high school diploma. Furthermore, in the 1940s, America's colleges and universities were not prepared for the influx of millions of new students coming from all walks of life.

In the post-war era, the U.S. rose to the occasion, showing a willingness to entirely re-think the role of higher education. That vision paved the way for three decades of steady gains in educational attainment and a corresponding decrease in educational inequality; dramatic increases in economic growth; and a series of scientific and technological advances that transformed America and the rest of the world.

Today's crisis has dramatically different origins – and consequences. The post-war era was a time of near limitless economic growth. American colleges and universities were coping with the consequences of steadily improving levels of educational attainment and enrollment at the secondary school level. The challenge then was building capacity to support the numbers of students flooding into the system.

In contrast, the current college readiness crisis is mostly the result of declining levels of educational participation and attainment over the past 30 to 40 years. It's occurring at a time of record-budget deficits and increasing global competition for skilled talent. As educational achievement has eroded in the U.S., the emergence of a global, knowledge-based economy has put downward pressure on American incomes, job security and standards of living.

The steady slide in U.S. high school performance, at least compared to the middle-part of the 20th century, was accompanied by a growing expansion of access to higher education in various forms. Many of today's students aren't ready for higher education and, more importantly, higher education isn't ready for them.

And while the will to completely reinvent postsecondary education existed in the 1940s, today we are struggling to apply industrial age solutions to the 21st century challenge of serving a college student population vastly more diverse and economically challenged than was the case for most of the post-war era.

Last year, Apollo Group released the first paper in this series, "Education, Jobs and the American Dream: How We Got Here," which discusses how growing educational attainment drove America's post-war economic growth. The goal of this series of papers is to spark dialogue, ideas, and ultimately solutions to our education and workforce readiness challenges. To continue that conversation, we asked a number of national leaders in education for their perspectives on today's college readiness crisis.

We spoke with Maura Banta, Director, Global Citizenship Initiatives in Education Corporate Citizenship & Corporate Affairs, IBM and Chair of the Massachusetts Board of Elementary and Secondary Education, who helped create innovative grade 9 to 14 STEM schools directly linked to jobs at IBM; Jean-Claude Brizard, Senior Advisor, The College Board and the immigrant son of a principal and a teacher; Alberto Carvalho, Superintendent, Miami-Dade County Public Schools who had the will

to replace 60 percent of his district's principals in order to achieve lasting change; Lisa Nutter, President, Philadelphia Academies, Inc. who credits a college counselor for keeping her from dropping-out of school; Margaret Spellings*, former U.S. Secretary of Education who commuted to college while working as a cashier in a grocery store; and David Stern, Professor Emeritus, Graduate School of Education, UC Berkeley, who believes his most valuable college experience was interning at a Boston housing project.

These education experts generously offered their perspectives, and their stories are included in the Appendix. We are grateful for their candor and their willingness to discuss how to reinvent higher education to better serve today's students.

*Ms. Spellings is a Director of Apollo Group, Inc.

The College Readiness Crisis of the 1940s

A NEW PATHWAY TO HIGHER EDUCATION

In the early 1940s, the United States, fully mobilizing for World War II, faced a clear and present college readiness crisis. Though few at the time could predict when the war would be over, at some point in the future, millions of veterans would return home to rebuild their lives, become educated and launch careers. Would the nation be ready? The experience after World War I taught the U.S. that interrupting the education of millions of Americans and then providing no pathway back to school was a recipe for economic and humanitarian disaster.

> *"The G.I. Bill leveled the playing field & challenged us to do something that we had never done before."*
>
> Margaret Spellings, former U.S. Secretary of Education

In a speech to the American Legion in 1943, Arizona Senator Ernest "Mac" McFarland, a veteran, who had found himself jobless and homeless after serving in World War I, outlined a plan to reintegrate returning veterans. That plan included a radical reimagining of the role society would play in helping veterans return to school.[2]

A year later, President Franklin Roosevelt would sign the G.I. Bill, providing an entirely new pathway to college and greater opportunity to enter the workforce for veterans. The main obstacle to success was not money – the patriotic spirit and public finances of the times were more than sufficient to support the funding of the G.I. Bill. The real challenge was that most veterans were unprepared to take advantage of this new benefit. In fact, nearly 10 million of them hadn't even finished high school.[3] Consequently, most veterans used G.I. Bill benefits to complete high school, not college.

Despite a poor, or interrupted, pre-war education and enduring the deprivations of the Great Depression, these veterans were ready to learn: they had been through military training; they had taken skills and aptitude tests mandated by the military at the time; and, most importantly, they had all just survived a war. Matured beyond their years by this experience, the veterans were backed by financial assistance and the full support of a grateful public. What these veterans needed was an on-ramp to postsecondary education that matched their unique needs and circumstances.

Towards this end, the Armed Forces Institute turned to Ralph Tyler with the University of Chicago. He was just the person to craft a system for those with unique educational challenges. Tyler had actually been kicked-out of high school. He eventually went on to finish high school at age 15 and then graduated from college at age 19 despite working nearly full-time in outside jobs.[4]

Tyler had developed a test of general education development, originally intended to be used as part of a correspondence course. According to the American Council on Education, the goal was to "determine proper placement of the individual [veterans] without wasteful repetition of materials they have learned through Army experience."[5] Hundreds of thousands of veterans used the General Education Development (GED) credential as it was originally intended to be used, as a tool for qualified students to enter college.

In the decade following the war, 2.2 million veterans would attend colleges and universities under the G.I. Bill. They were backed by an unprecedented national investment, equivalent to $158 billion in today's dollars.[6] They would throw open the doors of higher education just in time for a historic number of their fellow Americans of all backgrounds to follow.

Over a 50- to 60-year period, the U.S. forged an ever-widening pipeline of students who were, in dramatically increasing numbers, preparing themselves for college and the workforce. In the wake of World War II, it was uncertain whether the American system of higher education could transform itself rapidly enough to cope with this mass influx of students coming from more diverse educational and socio-economic backgrounds. A failure to transform would cause a major disruption in the upward trajectory of American social mobility and economic growth – a national readiness crisis in its own right.[7]

> ***2.2 million*** *veterans attended colleges & universities under the G.I. Bill.*

A REINVENTION OF HIGHER EDUCATION

President Harry Truman, the only U.S. President of the 20th century not to graduate from college, had set his sights on meeting that looming crisis head-on. In 1947, he appointed a Commission on Higher Education to provide a vision for radically restructuring the American system of higher education around principles of equality and accessibility.[8]

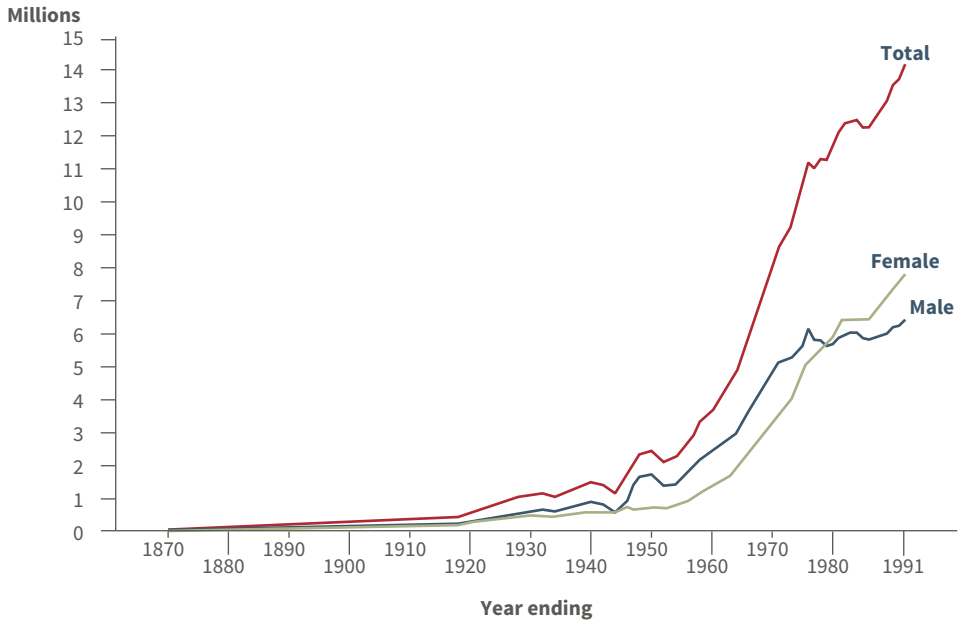
Citing the changing needs of a modern industrial society, the commission warned that colleges and universities weren't keeping pace with the growing enrollment or with the increasing diversity of needs and interests among the students.

The commission set-out an audacious vision of a world where college attendance would double, and half of all Americans would continue on to higher education— integrating vocational and liberal education, attacking racial and religious discrimination, and establishing federal aid to support these goals.

During this timeframe, community colleges became to America what schoolhouses were in the 1920s. Between 1965 and 1972, an average of more than one community college was built every week.[9] Large state school systems also played a role in expanding access to higher education. The State University of New York (SUNY) grew from 29 unaffiliated institutions to eventually include 64 individual colleges and universities.[10] States such as California, Texas and Florida also established signature state university systems, supplementing the colleges and universities already created by the land-grants of the 1800s.[11]

By the early 1970s, half of all high school students went on to some form of higher education and that number would keep growing for decades. In addition, the female-to-male ratios of college graduates increased about 30 to 60 percent from the 1970s to the 1990s.[12] During this timeframe, college enrollment soared and inequality in postsecondary education plummeted.

Figure 1. College Enrollment 1870 to 1991



Source: U.S. Census data compiled in "120 Years of American Education: A Statistical Portrait" page 65, figure 14.

THE ECONOMIC BENEFITS OF REINVENTING HIGHER EDUCATION

In the decades following World War II, public spending on higher education rose dramatically – and steadily. Over the next three decades, public revenues spent on higher education as a percentage of GDP increased five-fold.[13] In 1940, average public revenue spent per student in higher education was about $1,500. By 1970, it exceeded $4,900 per student .[14]

During that same time period, personal income grew from about $6,000 per capita to more than $15,000.[15] This was no coincidence. In fact, each additional year of educational attainment across the U.S. population corresponded with GDP increases of three to six percent annually.[16] And greater investment in American education is estimated to account for 25 percent of all productivity gains over the course of the 20th century.[17]

These productivity gains translated into wage increases and better job opportunities for educated Americans. Society as a whole benefited as well, as the tax base expanded, property values increased and urban centers developed across the country.

> *The average public cost for a citizen to obtain a higher education is roughly* ***$30,000****, but the public return as measured in economic growth is close to* ***$200,000****.*

The Organization for Economic Co-operation and Development (OECD) estimates that the average public cost for a citizen to obtain a higher education is roughly $30,000, but the public return as measured in economic growth is close to $200,000.[18] Some economists estimate that if the United States recaptures its world leadership in education, the long-run economic benefit would be more than $100 trillion.[19]

The Cracks in the Educational Pipeline

A CHANGING SOCIETY

The industrial-age institutions that make up America's secondary and postsecondary educational systems haven't changed radically since the 1960s. Yet the American population, which is supposed to be served by these systems, has shifted dramatically. In just 20 years, from 1980 to 2000, the Hispanic population more than doubled.[20] By the end of the 20th century, California, Hawaii, New Mexico and the District of Columbia had majority "minority" populations.[21] As we entered the 21st century, most of the population lived in the South or West, in metropolitan areas and were at least 35 years old.[22]

"It has been a real challenge for higher education to stay closely connected to both K-12 & the evolving needs of industry & its changing job requirements."

Maura Banta, Global Citizenship Initiatives in Education Corporate Citizenship & Corporate Affairs, IBM

The nature of the workforce has dramatically changed as well. As recently as 1970, a high school diploma was sufficient for most jobs and less than 40 percent of the labor force had completed any education beyond 12th grade. Over the next 40 years, the U.S. and global economy began to need, indeed demand, a different range of skills and a higher level of education. In fact, jobs were harder to come by for those with only a high school education. Between 1970 and 2007, the share of middle class jobs held by high school-educated workers decreased sharply, from 46 percent to 31 percent. [23]

Economic isolation, stagnating wages and the trend of wealthier families investing more time and resources on their children have fueled a rising educational disparity.[24] A study of standardized test scores found that the difference between the wealthiest and the poorest students increased by 40 percent between 1960 and 2007 – a difference, in practical terms, equivalent to three to six years of schooling.[25]

Unsurprisingly, these disparities have directly affected college achievement. In the early 1980s, there was a 30 percentage point difference in the proportion of prosperous versus poor Americans who earned Bachelor's degrees. The gap today is about 45 percent. [26]

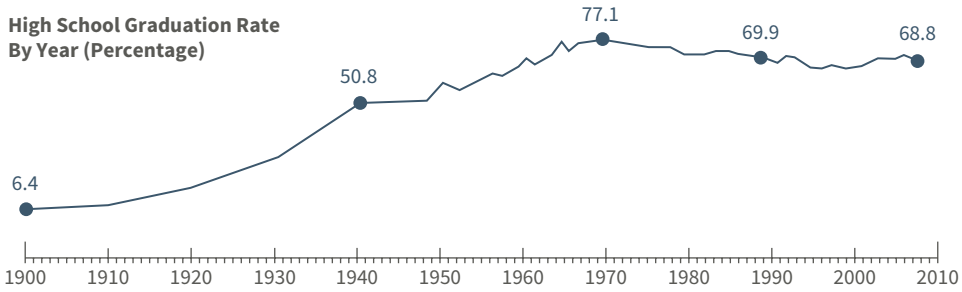
THE FIRST CRACKS IN THE EDUCATIONAL PIPELINE

These damaging trends in education have their origins in the late 1960s. By then, most of the recommendations of Truman's Commission on Higher Education were being funded and implemented. In fact, roughly half of all 18-year-olds had earned a high school diploma by the 1940s, more than five times the number of high school graduates in the World War I era.

Consequently, the U.S ranked first among industrialized countries in high school graduation, an achievement made possible by growing prosperity, social mobility, and vast investments in education following World War II.[27] The growing number of

Americans with a high school diploma "was an important part of human capital accumulation that fueled economic growth and produced rising incomes during the 20th century."[28]

Figure 2. High School Graduation Rates from 1900 to 2010

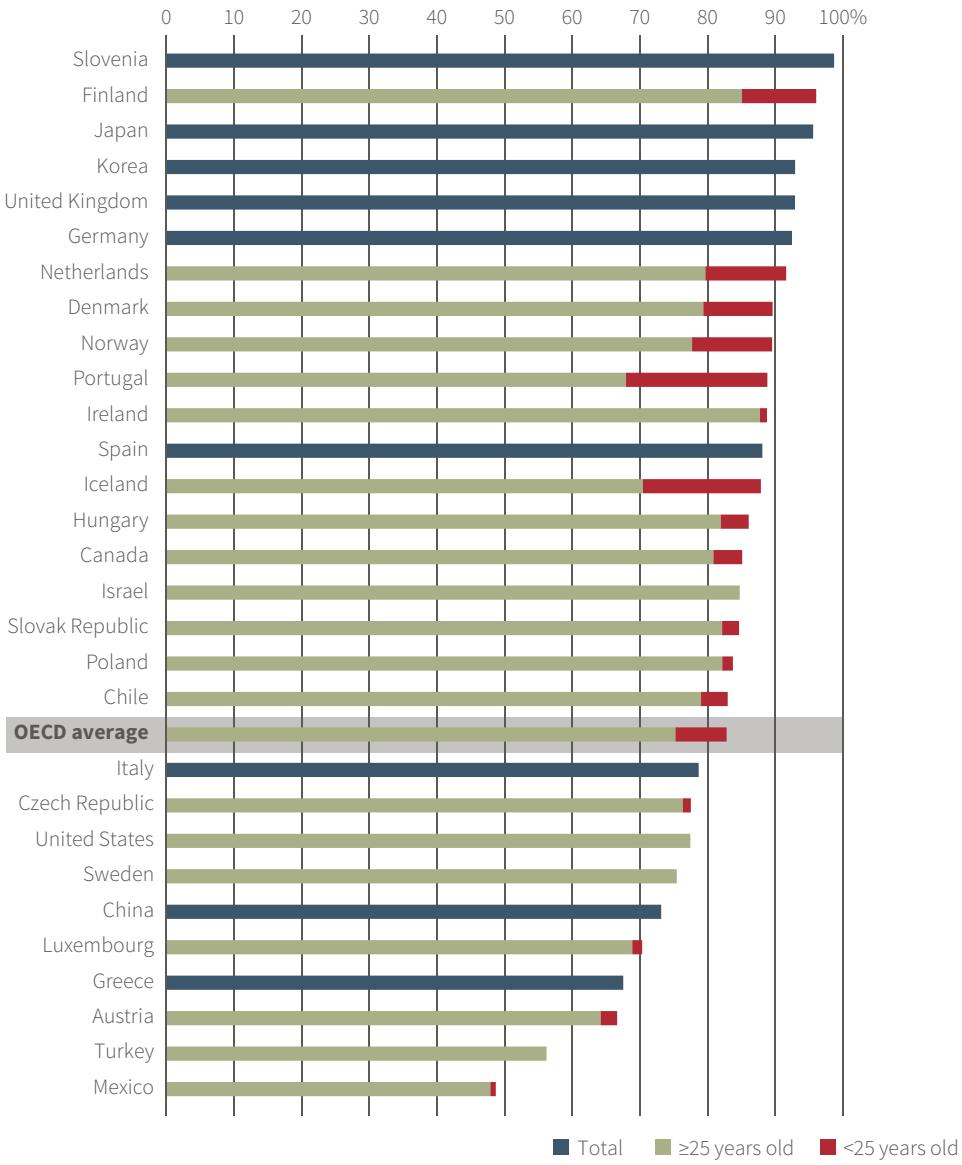


Source: http://www.edweek.org/media/34gradrate-c1.pdf.

However, an essential cornerstone of the commission's vision was beginning to show serious cracks. In the 1960s, the U.S. was in the middle of a sustained boom in the number of students attending and finishing high school. The American high school graduation rate had steadily increased between 1900 and 1970 by about 10 percentage points each decade. Then the advancements just stopped. The high school class of 1969 with its 77 percent graduation rate marked a historical high point.

Over the last four decades, high school graduation rates in the U.S. have stagnated as other advanced countries have steadily increased. Today, the U.S. has dropped to 22nd in high school graduation among OECD countries.[29]

Figure 3. OECD High School Graduation Rankings



Source: "Education at a Glance 2013," page 42, chart A2.1.
See: http://www.oecd.org/edu/eag2013%20(eng)--FINAL%2020%20June%202013.pdf

Declines in high school performance have been most profound for low-income and minority students, with only about 65 percent of African American and Hispanic students finishing school with a high school diploma.[30]

A study released in 2004 found that 12 percent of the nation's high schools were "dropout factories" responsible for half of the American students who leave school without graduating. Today there are more than 1,550 high schools with graduation rates of less than 60 percent.[31]

The lost wages for the students who dropped out of the class of 2011 will total **$154 billion** *over their lifetimes.*

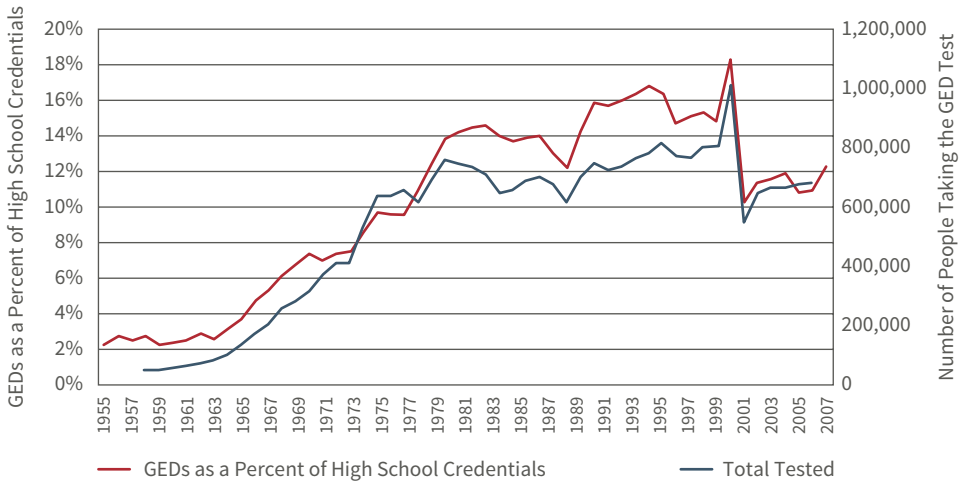
With more than 7,000 students dropping out of high school each day, the economic costs to the nation are staggering. According to one analysis, the lost wages just for the students who dropped out of the nation's class of 2011 will total $154 billion over their lifetimes.[32]

As President Barack Obama said of the alarming high school drop-out rate: "It's not just quitting on yourself, it's quitting on your country – and this country needs and values the talents of every American."[33]

The GED credential significantly impacts the drop-out rate as students increasingly opt for this diploma equivalent. In 1960, GED credentials accounted for about 2 percent of high-school credentials. Today, the equivalent figure is around 15 percent. Each year, nearly 700,000 high school students make a decision not to finish high school and ultimately get a GED instead.[34]

The original purpose of the GED was to help returning veterans whose secondary education had been disrupted by the war. It was intended to meet a particular need at a particular point in time. Today, the GED is being used as a fallback method to cope with the high numbers of high school students who drop out for one reason or another. In place of a coherent, effective program to prevent these kids from leaving school early, our society has come to rely on the GED. And the reality is, we simply don't know what else to do.

Figure 4. The Rise of the GED



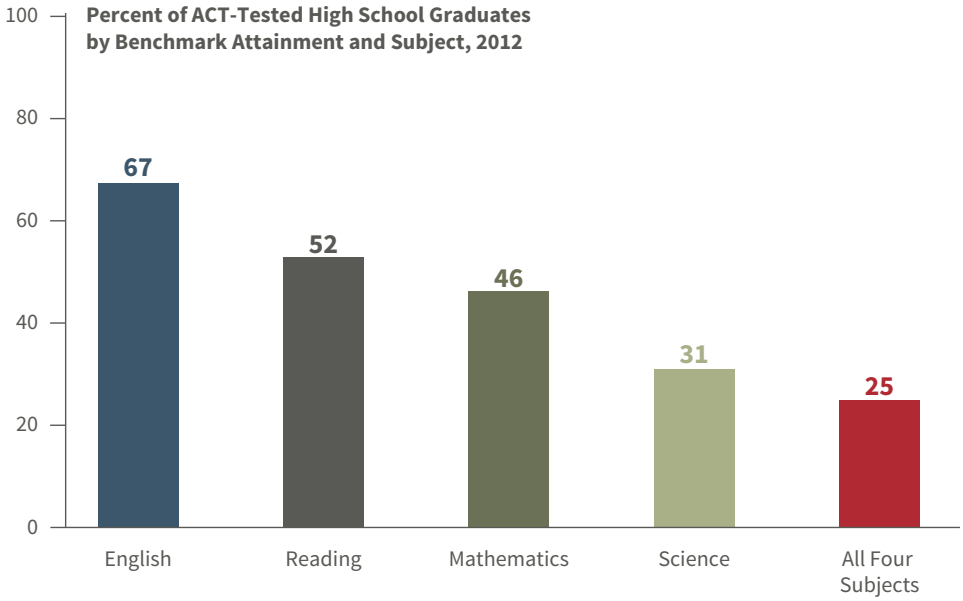
Source: Heckman, Mader, and Humphries (2010), Figure 1, page 5.
See: http://www.nber.org/papers/w16064.pdf?new_window=1 .

COLLEGE READINESS DECREASES

This leveling-off and decline of high school graduation rates was followed by a drop in the readiness of students to attend college.

Consider that a record 1.66 million high school students took the SAT in 2012 and 82 percent said they wanted to pursue higher education.[35] Yet the results show that only 43 percent met the SAT's college and career readiness benchmark.[36] Furthermore, only one-fourth of high school students taking the ACT had the knowledge and skills needed to succeed in college English, reading, math and science. Perhaps the most shocking of these disparities, is that only five percent of African American students and 13 percent of Hispanic students were deemed by ACT testers as college-ready in those subjects.[37]

Figure 5. College Readiness Scores



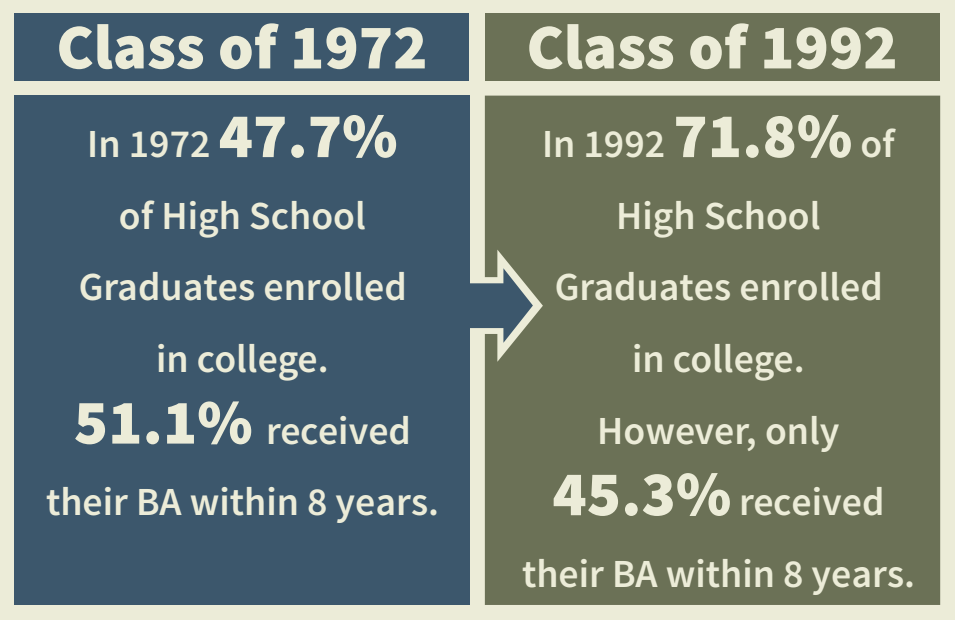
Source: ACT "The Condition of College and Career Readiness 2012," page 3.
See: http://media.act.org/documents/CCCR12-NationalReadinessRpt.pdf

These standardized test scores reflect a lack of advancement, if not decline, in learning and proficiency of too many American high school students, at least when compared to other developed countries. The lag is especially pronounced in math and science.

One study found that only 27 percent of the nation's 12th graders were proficient in understanding the ideas fundamental to the workings of a democratic society[38] – troubling given that one of the stated purposes of universal secondary education was to strengthen American democracy.

In the past, fewer high school students attended some form of college, yet they were better prepared for the experience and typically did well enough to graduate. Roughly 40 percent of the high school class of 1972 went on to college, a number that increased to 70 percent in 1992.[39] As access to higher education increased for a larger swath of the high school population, college completion rates began dropping for the first time in American history.

Figure 6. College Enrollment Increases while College Graduation Rates Decrease



Source: table 1, page 65. See http://www.psc.isr.umich.edu/pubs/pdf/rr07-626.pdf

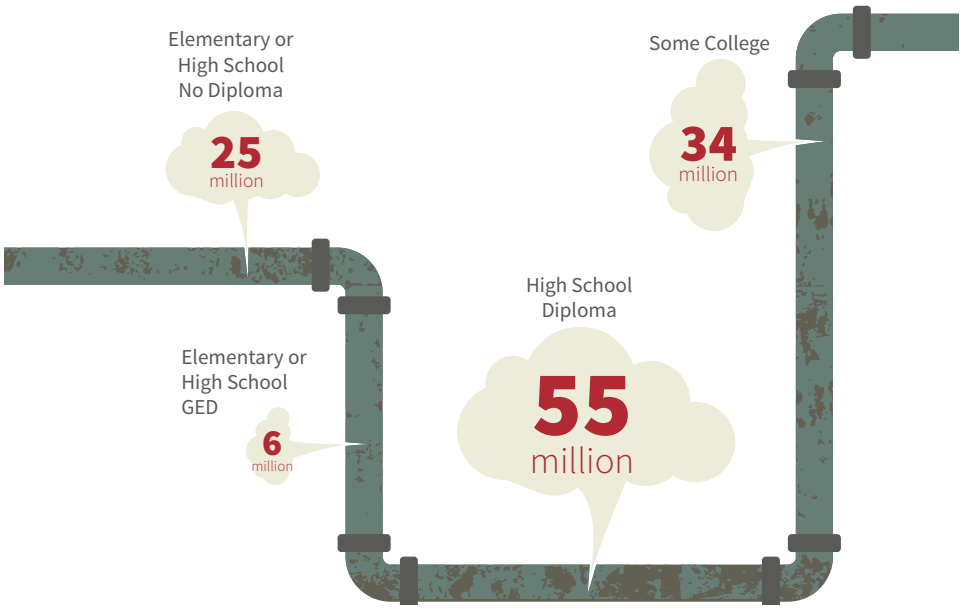
Nearly 75 percent of all high school students pursue some form of postsecondary education within two years of graduating. However, only about half of those students attending a four-year institution graduate within six years. Of those who attend community college, the completion rate is roughly 30 percent.[40] Low-income students, from households with annual incomes of less than $40,000, are even less likely to succeed. Only nine percent of low-income students complete college.[41]

A PROBLEM BEYOND THE GRASP OF HIGHER EDUCATION

Today's college readiness crisis is the result of declining overall educational attainment. In this respect it is more serious than the college readiness crisis of the 1940s which was a "crisis" created by growing wealth, opportunity and achievement following World War II.

For most of the 20th century, the U.S. attainment in education increased an average of one year per decade. Starting in 1980, it slowed by roughly fifty percent to about half a year per decade. The result is an accumulated 100 million missing years of education in the U.S workforce. According to one study, gaps in educational achievement have amounted to a loss of $1.3 trillion to $2.3 trillion in U.S. GDP.[42]

Figure 7. Educational Pipeline in the U.S.: Over 120 Million without a Degree



Source: U.S. Census, Detailed Years of Schools, http://www.census.gov/hhes/socdemo/education/data/cps/2012/tables.html

Persistent decade-after-decade declines in educational attainment have left 120 million adult Americans without a college education. The fundamental problem behind these alarming results is that our system of postsecondary education isn't ready to deal with the obstacles faced by today's incoming students, who are very different than their peers 60, 40, or even 20 years ago.

About 70 percent of enrolled students are considered "nontraditional."[43] On average, they are more than 25 years old and more likely to be women, minorities, and financially independent of their parents. By 2000, there were over six million nontraditional undergraduate and graduate students, more than the total collegiate enrollment in 1968.[44]

Yet our college and university system has not adjusted to the scale of change that's needed. We are attempting to address 21st century challenges with practices and assumptions left over from the 1960s and 1970s that no longer reflect the needs of today's student population. To reclaim American leadership in education we must find a way to breach what's been called "a profound organizational, political, and cultural chasm [that] persists…between the systems of K-12 and higher education."[45]

LETTING OUR TALENT GO TO WASTE

The traditional approach to helping poorly prepared incoming students provides a case in point. This problem does not affect elite colleges and universities that can select the most academically proficient high school graduates. It is the "first rung" educational providers – and in particular, community colleges – which are clearly bearing the brunt of this problem.

Upwards of 60 percent of students entering community college are considered unprepared in at least one area of study.[46] Many of these incoming students are asked to take remedial classes to prepare for college-level studies. Yet a recent analysis found that 30 percent of students never even get started on developmental courses after being referred to them.[47]

> *"What we observed on the [Spellings] Commission on the Future of Higher Education is that now we have to look at different models to reach further into different populations. It requires change."*
>
> Margaret Spellings,
> former U.S. Secretary of Education

Ultimately, fewer than one in 10 community college students referred to traditional remediation graduate within three years.[48] There are numerous reasons why we lose so many students before they complete their education; pointing to a wider set of issues that must be confronted in order to solve today's college readiness crisis.

Figure 8. Attrition in Remedial Schooling

Source: "From Roadblock to Gateway: Improving Developmental Education for Success," page 1.
See: http://edfunders.org/downloads/GFEReports/from_roadblock_to_gateway.pdf

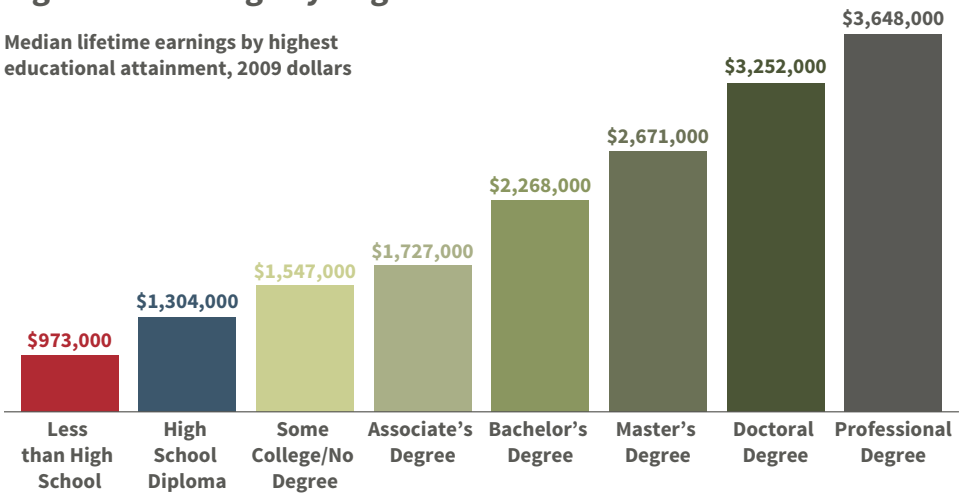
NO ROADMAP FOR THE FUTURE

Financial and family pressures are increasingly common reasons for young Americans to put off, interrupt, or abandon their dreams of higher education. In fact, the expense of postsecondary education is taking a serious toll. In 2012, the Consumer Financial Protection Bureau reported that the $1.1 trillion student debt surpassed auto loans and credit cards as the largest source of U.S. household debt behind home mortgages.[49]

According to the National Center of Education Statistics, 80 percent of students work while enrolled in postsecondary institutions and half of those are working full-time.[50] Another study found that two-thirds of young Americans who placed their college education on hold did so to support a family while another 48 percent said they could not afford the expense.[51] However expensive college may seem at the time, not completing one's higher education turns out to be far costlier over

the long run. By one estimate, a bachelors' degree typically leads to 84 percent greater earnings than a high school diploma – worth nearly $1 million in lifetime earnings.[52]

Figure 9. Earnings by Degree



Source: Georgetown Center for Education and the Workforce, "The College Payoff: Education, Occupations, Lifetime Earnings," (2011) page 3, figure 1.
See: http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/collegepayoff-complete.pdf

Recent research suggests that the longer it takes students to begin a specific program of study in college, the less likely they are to complete a degree. Many students who drop out don't see how they'll be able to navigate through college and into the workforce. Because high schools, colleges and universities aren't providing students with a clear, persuasive roadmap for the future, far too many individuals conclude that postsecondary education is not worth the time and the expense.

UNDERAPPRECIATED VALUES: PASSION, PERSEVERANCE AND "GRIT"

It turns out that in the 21st century, one of the most important lessons students can learn is the value of staying the course in pursuit of higher education. In this respect, attitude is more important than aptitude.

Consider that at first glance, the National Spelling Bee would appear to be a pure measurement of verbal ability. Angela Duckworth, a professor at the University of Pennsylvania wondered if there was a different explanation. So she sent a note to the organizer of the spelling contest asking if it was possible to administer a psychological test to find out why certain kids won. Dr. Duckworth received a response (first correcting her spelling) and then giving permission to run the test.

What she found was that verbal IQ—the primary cognitive skill in play—was only half as good at predicting who'd win as something she called "grit." In tests of National Spelling Bee champions, West Point cadets and Ivy League graduates, she found that it was the intangibles of "perseverance and passion for long-term goals" that better predicted success. [53]

Figure 10. The Essence of Grit

Source: "Exploring How to Measure and Build Students' Non-Cognitive Skills to Increase College Persistence", NACAC National Conference 2012. Angela Duckworth, Ph.D., Donald Kamentz, Laura Keane.
See: http://www.explo.org/email/exploring_ed_002.html

Duckworth's research found that university students with a higher degree of "grit" earned higher GPA scores, even in cases where they had lower SAT scores. Although the traditional on-ramp to higher education focuses on building cognitive skills, recent research suggests that these skills are only one part of the path to success.

Students who are well positioned for success don't just score high on standardized tests. They are able to accept criticism, learn from failure, defer gratification and pursue long-term challenges even with little immediate reward. We are only beginning to understand how to recognize and nurture "grit" among this generation of American students. And while the U.S. education system is struggling to imbue these coping skills, many otherwise capable students are falling by the wayside.[54]

"Where higher education needs to move is towards an educational experience that is more project-based, more experiential, and reflects more of what happens in the real world and how it functions."

Lisa Nutter, President, Philadelphia Academies, Inc.

INNOVATION AND COLLABORATION

During the mid- to late-20th century, education could ride the broader wave of rising American prosperity that allowed for vast public investments in education. Today's 21st century realities require an even bolder and more innovative approach involving both the public and private sector. Simply throwing more money and people at the problem won't do, and the consequences of failure are severe.

While the United States faces no shortage of fiscal and political challenges, it has always had the advantage of vast reservoirs of ingenuity and idealism. Combined with active engagement from the private sector, increasingly desperate for qualified workers, these attributes can and should be applied to remedy our national college readiness crisis.

MAKING CONNECTIONS AND BOOSTING PERSISTENCE

There is a growing body of research showing that students – especially working students – who feel their school cares about them as individuals are more likely to persist. To stay enrolled, students must believe that their campus is part of their lives, but this belief is harder to develop for nontraditional students, including part-time, commuter and older students.[55]

The dilemma for nontraditional students is that, although they are the most in need of assistance, they have the most difficulty finding time in their schedule to seek help. Best practices clearly show that making support networks "intrusive" and built into the architecture of their learning is what creates these essential connections.

Traditional postsecondary education can be impersonal and isolating. It leads many students to believe that they do not belong in college. Mentorship, advice, and counseling can help such students persist in their studies through to graduation. Recent studies show that mentoring by college faculty has a positive impact on students' persistence and academic achievement in college while preparing them for success in their professional careers.[56] Minority students do especially well when partnered with a mentor. They are twice as likely to persist as non-mentored minority students and to have higher GPAs.[57]

REINVENTING THE PATHWAY BETWEEN HIGH SCHOOL, COLLEGE AND CAREERS

In 1930, the roads connecting parishes in Louisiana were paved for a few miles before inexplicably reverting back to gravel and dirt roads, leaving drivers mired, sometimes for days, between gaps in the highway. Governor Huey Long intentionally distributed these gaps across the state to create public demand for a single, seamless freeway system.[58]

In many ways, the traditional American system of education – as students proceed through high school, college and into the workforce – is like that highway system. There are chasms at each stage of the process. It's also a path that largely goes in one direction from education to the workforce. Truly re-thinking higher education means breaking down these silos and building a whole new lane – from education, to the workforce and back again.

Innovative public schools in New York and Chicago are reinventing the very concept of high school and college and entirely eliminating the barrier between them. In these schools, formed in a unique partnership with IBM, college begins effectively in 9th grade. Pathways in Technology Early College High Schools (P-TECH) span grades 9 through 14, leading to an associate's degree in computer information systems or electromechanical engineering. Each student is assigned an IBM mentor who provides support and a clear roadmap for the future.

P-TECH was born out of the notion that a student needed at least two years of community college to have a degree that would prepare them to work in a wide range of industries.[59] The partnership between Mayor Michael Bloomberg, New York public schools and IBM creates a comprehensive process that maps high school curriculum and college coursework to the skills required at IBM. Students don't need to take a test to enroll, they begin taking college-level courses no later than 10th grade and graduate with the skills necessary to succeed in entry-level IT jobs.

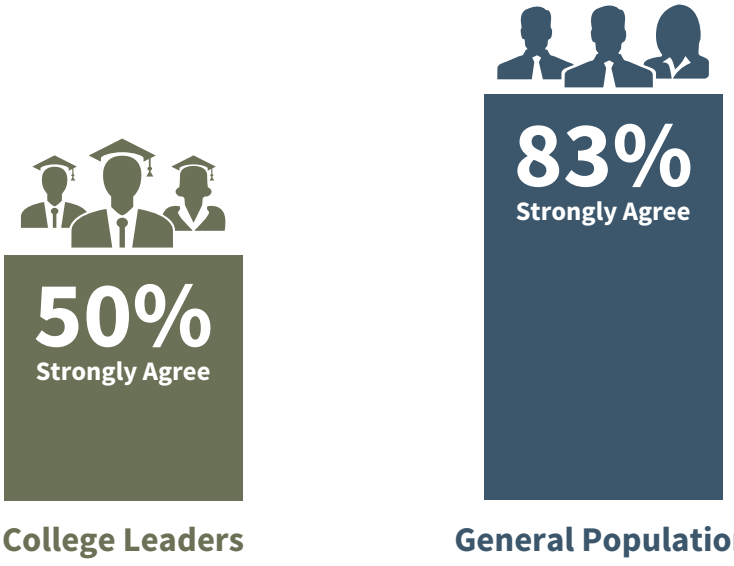
In the Miami-Dade County Public School District, educational leaders and the business community are building a pathway between middle school, college and the seven critical industries in South Florida that will require skilled workers over the next five to 15 years. The district superintendent and the president of Florida International University are blurring the lines between middle school and higher education, opening schools together with a common agenda for enrollment, infrastructure, technology, world languages, bilingual education, clinical internships and pre-collegiate preparation. The community supports this type of collaboration to better prepare students for their futures.

"Begin to help people connect a career to education. Help students frame what career they're thinking about going into. . .If you are the higher education institution, you need to understand what the student is going to be doing for employment post-college."

Jean-Claude Brizard,
Senior Advisor, The College Board

Figure 11. The Need to Connect Courses with Careers

At many colleges, there is too much of a disconnect between the courses offered and students' career goals



Source: Time/Carnegie Corporation of New York Survey, 2012.
See: http://nation.time.com/2012/10/18/higher-education-poll/?pcd=teaser

One key to making these reforms work is active involvement from the private sector. For example, the demand for network administrators, specialists and architects is projected to grow by more than 20 percent by 2018. To get ahead of an expected skills shortage, Cisco has been a leader in providing immediately-useful training on a global scale. The Cisco Networking Academy has 9,000 local academies in over 165 different countries. In 2012, University of Phoenix became the first university to offer an associate degree program with a concentration specifically designed with the Cisco CCNA® certification as part of Cisco's new Workforce Transformation Program.

Reinventing these pathways requires high schools, colleges and the private sector to sit down together to develop lesson plans, course catalogs and job descriptions. But what's clear is that it can work. With a determination to make significant changes – and sustain long-term commitments – there is no need for millions of students to end-up stuck in the gaps created by our current system of education.

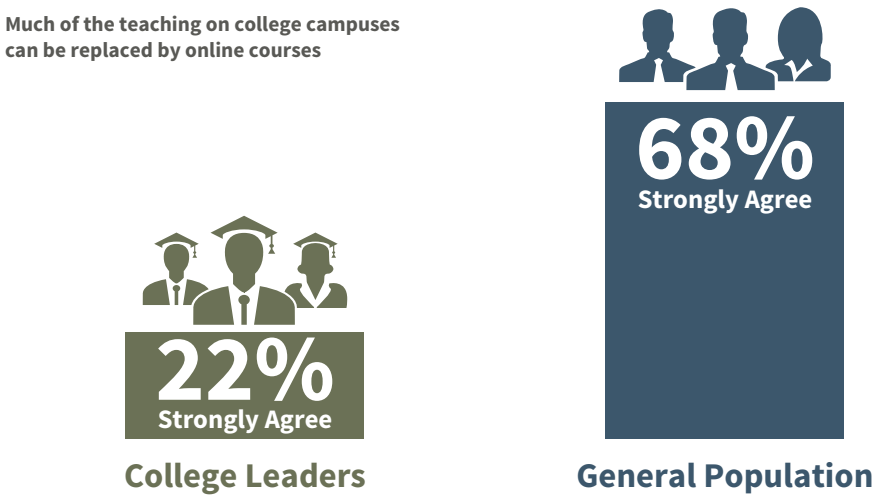
REDESIGNING THE ARCHITECTURE OF SCHOOLING

As the United States expanded westward during the late 19th century, the federal government granted more than 17 million acres of land on which to build new colleges and universities. In the early and middle-decades of the 20th century, the United States experienced a booming "brick and mortar" expansion of educational opportunity though the construction of new schoolhouses and campuses, which averaged more than one community college opening per week at its height.

In the 21st century, the architecture of expanding educational opportunity is increasingly non-physical. It is defined by systems, IT infrastructure and innovation. New buildings, though necessary in some cases to replace crumbling K-12 facilities, will not solve the now-pervasive problem of extending educational access to people who can't (or won't) go to a campus. It will require connecting people who will rarely, if ever, meet in person; and adapting curriculum so students can make progress towards a degree, as they remedy gaps in past education. As an example, University of Phoenix is constantly innovating to help working adults move efficiently from education to careers with flexible schedules, relevant and engaging courses available both online and on campuses, as well as interactive learning formats and career services that help today's students more effectively pursue their goals while balancing their busy lives.

> *"The school system ought to be a portfolio, an array of opportunities. Deviate from the one-size-fits-all educational model."*
>
> Alberto Carvalho, Superintendent, Miami-Dade County Public Schools

Figure 12. Support for Online Education



Source: Time/Carnegie Corporation Survey.
See: http://nation.time.com/2012/10/18/higher-education-poll/?pcd=teaser

We are in the very earliest stages of the next great wave in access to education. According to one recent study, only one-third of students in U.S. higher education have taken an online class.[60] But the same survey also showed that the student population online is growing 10 times faster than students taking traditional classes. Online course providers including universities and education companies use a range of models from per fee, limited-enrollment classes and MOOCs ("Massive, Open, Online Classes"). While MOOCs mostly serve people who already have degrees, these other types of flexible education options can lead to certificates or degrees and allow students to combine more traditional learning with vocational studies based on skills required for a particular job.

Already we're seeing the potential of even the most rudimentary technology to transform education at all levels. Consider these examples:

- A non-profit organization, called One Laptop per Child, gives tablet PCs, preloaded with literacy apps to children in an African village. In less than a week, with no instructions, children who had never before seen words on screen or on paper were using nearly 50 apps a day.[61]
- An 11-year-old student in Pakistan was taking an online physics exam when her government blocked access to YouTube. She was able to turn to a fellow student in Malaysia and a Portuguese physics professor to help her finish the test.[62]

Unlike the 19th century land grants and 20th century schoolhouses, which were funded nearly exclusively by government, the architecture of schooling in the 21st century will require public-private partnerships to drive innovation in education and continually adapt to changes in technology and evolving workforce requirements.

ADAPTING AND PERSONALIZING THE LEARNING EXPERIENCE

Advanced educational technology is becoming more widely available every day. Students at all levels can use social media to access individualized learning tools and around-the-clock educational support via phone, email and social networking.

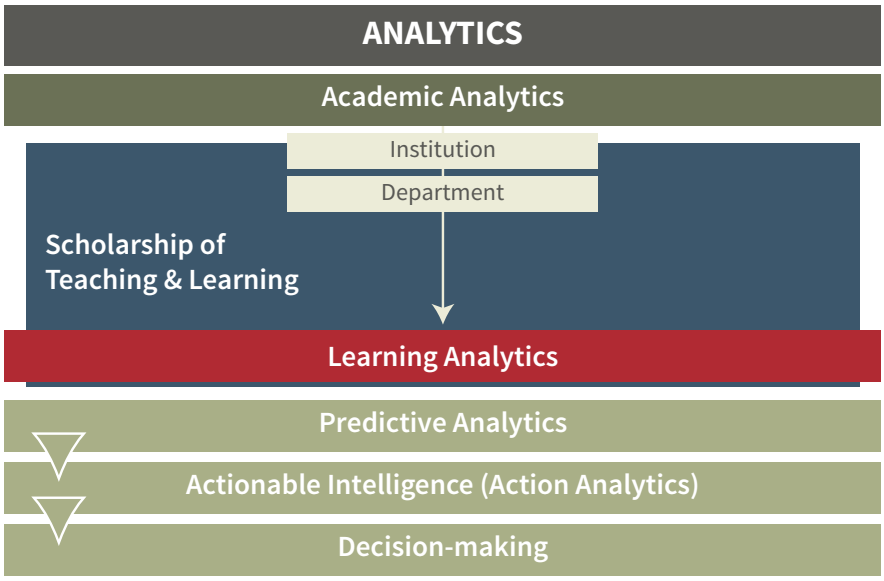
Students can be placed into small virtual groups with the right combination of goals and skills. Learning analytics can serve as an early warning system, identifying rough spots in the curriculum or providing course corrections for students about to drop-out. Adaptive learning technology can identify gaps in each student's college readiness and recommend additional work built directly into the credit-bearing courses that will keep them engaged.

New learning technologies are helping students overcome what is perhaps the biggest barrier to entry in higher education, namely algebra. Apollo Group subsidiary Carnegie Learning's Cognitive Tutor Algebra curriculum for middle and high school has been recognized by the Institute for Education Sciences for its substantial positive effects on student learning. The Institute's "What Works Clearinghouse" initiative found that Apollo's algebra program gives students a 70 percent greater chance of completing subsequent math courses and 15 to 25 percent better scores on the SAT.[63]

HARNESSING STUDENT DATA

Colleges and universities have been under increasing pressure to graduate students more quickly and cost-effectively – and to improve graduation rates. Higher education is looking to predictive analytics for part of the answer. Predictive analytics leverages past and current student data to predict future student performance. The information can help students stay on track to graduate and alert them when they fall behind.[64]

Figure 13. Analytics in Higher Education



Source: Angela van Barneveld, Kimberly E. Arnold, and John P. Campbell , "Analytics in Higher Education: Establishing a Common Language," Figure 2. See: http://net.educause.edu/ir/library/pdf/ELI3026.pdf

Predictive analytics can also assist postsecondary institutions better identify students at risk of dropping-out and degree pathways that facilitate student retention and graduation or, alternatively, student attrition, while also integrating faculty input into the overall institutional retention effort.[65]

Eduventures recently conducted interviews with institutional executives experienced in applying predictive analytics along the student life cycle, and all reported measurably improved recruiting, retention, as well as resource utilization. The implications are a more efficient use of resources and more students stay in school.[66]

Apollo Group, parent company of University of Phoenix, has made significant investments in a learning-focused portfolio, including IT infrastructure, data centers and learning analytics. If one-quarter of public spending on education were similarly invested, it would amount to a more than $80 billion dollar upgrade of our country's education technology infrastructure.[67]

PROGRESS THROUGH PARTNERSHIPS

In 1989, as a young Governor and president of the National Governors' Association, Bill Clinton worked closely with President George H.W. Bush to write the National Education Goals; setting the stage for "Common Core," a new era of reform through state-federal partnerships in K-12 schooling.

These goals were the first of a number of national initiatives to improve primary and secondary education. The Race to the Top competition, launched by President Obama and Secretary of Education Arne Duncan in 2009, provided $4.35 billion to create incentives and encourage innovation in U.S. public schools. Since then, schools have re-focused their efforts and resources on increasing completions, including a new national uniform standard for measuring graduation. As a result, high school graduation rates showed at least some improvement across the nation for the first time in years.

What we need now are partnerships of a similar scope to address the major postsecondary education policy challenge of the 21st century: reaching millions of adult learners who now make up a predominant share of the students attending America's undergraduate institutions. As we undertake the next great reimagining of postsecondary education, we must also provide pathways back to education for the millions of people who left school before obtaining their college degree.

As the record of the past 20 years shows, governors and states are proven leaders in education innovation. A state-led partnership called Complete College America has built an alliance of states to set college completion goals, develop action plans and collect and report common measures of progress. It's also working to reinvent the broken traditional system of remedial schooling.

Leveraging its online learning capabilities and insights into connecting education to careers, Apollo Group is forming partnerships with major IT companies to help restructure global IT education. With these world leaders in IT, Apollo Group is working to create a next-generation online education marketplace that will reinvent the model for IT education, training and recruitment.

Request for Participation

WHERE DO WE GO FROM HERE?

In the late 20th century, President George H.W. Bush and soon-to-be President Bill Clinton forged a groundbreaking state-federal partnership. Nearly a quarter-century later, it has become clear that partnerships between government, educational institutions and the private sector will be essential to solve today's problems.

It is an ideal time for collaboration to address the needs of today's student population: older, more diverse, working adults. Together, we can build flexible pathways from education and training to the workforce and back again, leveraging the latest education technologies, new education delivery mechanisms and other innovations so that postsecondary education connects to employability.

Our primary objective in writing this series of papers is to spark conversations with diverse groups and individuals who can help formulate solutions to these 21st century challenges. Apollo Group has developed some core competencies and insights, including using technology and innovation in education, scaling teaching, building education-business partnerships and understanding nontraditional students, which we'd like to offer to the broader discussion.

We invite you to participate and welcome your input and recommendations. If you would like to share your perspective or learn more about our series, please email us at apolloworkforceinitiative@apollo.edu.

Appendix*

*Interview transcripts have been edited for clarity

MAURA BANTA, DIRECTOR, GLOBAL CITIZENSHIP INITIATIVES IN EDUCATION CORPORATE CITIZENSHIP & CORPORATE AFFAIRS, IBM

Tell us about your educational experience.

I'm one of the lucky ones to come from generations of people who were the beneficiaries of higher education and even advanced higher education. I was the eighth of 11 children, and it was never a question of if you go to college, it was where. I had a lot of brothers and their influence inspired an interest to major in economics with an eye toward a career in industry. I interviewed with IBM straight out of college. It's where I started and where I am still working some 39 years later. I've had a terrific career thanks to a great education that made me eligible to be hired into the high-end computing area of IBM - a terrific company which opened the door to many opportunities.

What made you feel connected to your college experience?

Community service made me feel more connected. It helped me understand that the world encompassed a much bigger place than just my family and school. I spent a year of college abroad in England where I learned how differently education was structured there than in the US. I think my role at IBM today is the result of many factors that began in college, took shape during the early part of my career, and then came into focus when I assumed the citizenship part of my career at IBM.

Were there things at the time that you thought were preparing you most for your career? And looking back, do those things still resonate?

For me they are one in the same. As an economics major—not a business major—part of the requirement was to write a senior thesis which compelled me to think and write critically. Another part of my requirement was that I work as an intern and I chose to work in finance and administration in New York City. I won't say that the work I did was very glorious or high level, but it certainly gave me a taste of what it was like to have a real job, as opposed to theorizing about a real job.

You chair the Massachusetts Board of Education. How did your interest in public service come about?

It is the result of spending a couple of decades in education policy, which is directly related to IBM's focus on the importance of education in this country. Through this work, I met policy makers, elected officials and businesspeople and became known as someone who saw the need for early childhood, K-12 and higher education to be more directly linked. I also believe in the importance of measuring accountability - particularly in K-12 - so that we can learn from past mistakes and move forward. I was asked to take on this role because while I come from the world of business, I also truly appreciate both the complexity and the promise of education.

From your perspective, as you look at the 40s, 50s and 60s, what were some of the most significant changes that we made or the ways that we expanded access to education and opportunity?

Back in the 40s and 50s, fewer people went to college. Certainly the G.I. Bill helped many veterans attend college, but fewer people went either because they weren't prepared or they didn't have the opportunities, the finances, or the desire. Many jobs didn't require a college degree and you could have a very successful and happy livelihood with a high school diploma. Obviously, that has changed.

But at the same time, jobs are changing and they're becoming more complex. It has been a real challenge for higher education to stay closely connected to both K-12 and the evolving needs of industry and its changing job requirements to produce the kind of education that enables its students to succeed.

Yet college enrollment continues to increase and college completion has dropped over the last four decades.

Yes, it's always a two-way street. It's a waste of time to have one silo point and say- this is what you didn't do. Education is a continuum. As the recipient of K-12 students, higher education has both the obligation and the opportunity to influence what happens in elementary and high school. And, K-12 has the same opportunity with early childhood and higher education because they are both sending students to college and are the recipients of teachers who come out of higher education. I think of it as one circle.

There is such a focus on standards and accountability in K-12 that has emerged in the last couple of decades. It's no secret that we have 50 states with different sets of standards, but we're getting much smarter as a nation about giving students in Alabama the same opportunities as students in New York. Education must be portable for the sake of both students and their future employers. I think this realization has helped to improve the K-12 sector.

At the college level, much has changed. For example, college has become extremely expensive and this fact is compounded when first year students are placed into remedial, non-credit bearing courses. It is both expensive and de-motivating. That's reality. So you see a high dropout rate based on the fact that they're not necessarily ready for what college is expecting of them.

This relates to what I said earlier about the two-way street. If college expects something different from K-12, it needs to map itself back into K-12 and say- you're essentially sending us a graduate with these sets of strengths and deficits. So, let's tell the graduate earlier in his or her cycle, in the 10th grade, exactly what they need to work on to succeed in college. And as we become a more diverse society, today's model gets a little inequitable. Some students are better prepared for college because of their demographics. Many students go to college unprepared to manage their time because K-12 is such a structured environment and higher education is not. Many go there with insufficient levels of preparation in both English and math. These are among the things that we just have to fix.

Do you have any thoughts on how colleges or universities can map themselves back to K-12 better than they have been?

Colleges are largely focused on the college readiness piece. More recently, in the last half dozen years, they're starting to focus on career readiness because they're judged by how many people get jobs when they graduate. There has to be a realization that the clients have changed, the clients being the students, and if you are in the business of service to your client, you need to change with the times.

If you could start with a clean slate and start over with systems of higher education, what would you change?

Financing. Money is something that holds a lot of people back in this space which results in some students completing their first year but then dropping-out. They want to get themselves ready for the second year, but they never get back.

What else can be done to bring people back into the higher education pipeline?

IBM and partners have created a model that's a perfect example of achieving not just a credential, but a degree. P-TECH was born out of the understanding that there were so many people left behind, and that maybe everyone was not going to immediately get to grade 16 as I was able to do. It was born out of the notion that you needed at least two years of community college to have a degree, a certification, a qualification that would make you portable across a number of industries. People can exit the program and say- I can do X, Y and Z because I have this associates degree.

P-TECH starts in the 9th grade. But for those already through the system, there are models in this country that start by getting them up-to-speed with some basic workplace skills. They add some technology skills, and get an internship so that they have a more complete package when they're trying to get a better paying job. And those models, like the Year Up program, take people from an $8 an hour job to a $25 an hour job in the course of a year. They're hugely successful. But it's a gigantic challenge because there are so many people out there without enough education to have a life-sustaining wage.

My preference, if we could wipe the slate clean, would be to start focusing on this in middle school so that you don't end up with so many people at the end without the right kinds of credentials. College isn't for everybody. But, they should at least be allowed to aspire to it, to understand that what they're learning in high school and early college applies to the world of work, and then to put themselves on the trajectory to either get that bachelor's degree, the master's, the Ph.D. or to stop with a grade 14 degree.

How did P-TECH get off the ground?

P-TECH started in Brooklyn as a result of conversations between New York City Mayor Bloomberg and the leadership at IBM. The Mayor was focused on how many vacant jobs he had in New York City and how a company like IBM (which employs people with community college degrees) could help.

P-TECH is a six-year model, using public school funding, that starts in the 9th grade. Students aren't screened and do not take a test to get in. They just need to commit to wanting to go to this school, which is essentially a STEM school. And through six years they earn both a high school degree and an AAS degree, an associate degree in applied science in either computer information systems or electro-mechanical engineering.

It's different in that it's really focused on a commitment to college early in the process. Ninth graders know that they are already on a pathway to college, and many of them would describe themselves as in college. They start taking college level courses as early as the summer before 10th grade, and certainly no later than 10th grade. There's a focus on careers. IBM committed to take some of its available jobs in New York and work with the CUNY system and CityTech in particular to backward map those skills so that they can be taught in the high school or community college.

The neat thing is- these skills become very relevant to them because they're learning them in the math class and the English class, and all of a sudden the question "Why do I have to do algebra or calculus or physics?" is explained by the way that subject matter expertise is applied. So, it's exciting to the students and they talk about this in a very mature way for 14- or 15-year olds. In fact, I've been to P-TECH in Brooklyn a couple times and I'm absolutely blown away by the level of conversation I'm having with these young adults.

One big difference is that the six-year pathway is definitely personal. Some of these students are coming in with a 4th- or 5th-grade level of reading and they've got to catch up very quickly in the beginning of the 9th grade to be on task and on this trajectory. The school has to be a little bit flexible with time blocks and the use of time to make sure that the fundamentals that need addressing early on in the game are addressed, and that people get to the place they need to go. We don't expect every student to move at the exact same pace. And they've also been able to employ a longer school day, which is important when you're trying to get a lot done in a relatively short amount of time.

This is a very solid partnership between industry, in this case IBM, higher ed, CUNY and CityTech, and the New York Department of Education. You have to give all entities credit here for trying something bold and new. P-TECH is very exciting in its second year in New York. It's been replicated in Chicago, where the model is in its first year. There are three other companies in Chicago which have started 9-14 schools - Cisco, Motorola and Verizon Wireless - and this is something that

many companies have expressed interest in and IBM is most interested to share anything we have - experience, collateral - just to make sure that we encourage them to do so.

I think the beauty of the educational system in this country is that you prepare a person for whom grade 14 is the beginning and not the end. The options are very broad at that point in time to start working and continue while you're working to go into a variety of industries.

What advice would you give to companies, school districts, or policy leaders who are thinking of trying this model?

First, do an assessment of where their three sectors are. And be honest about how welcoming K-12 and higher education would be of business and businesses' opinions. Can K-12 and higher education make themselves more permeable? And there needs to be some flexibility. Ask the tough questions.

I'm not sure this model should be everywhere, but there should be many, many hundreds more of these types of programs. States have been more focused on the opportunity gap; some just don't get there because of all the other circumstances in their life. States know they need to do something out of preservation, to fill unfilled jobs, or make their tax base more productive. To give students the opportunity to achieve the highest level of education they wish to achieve is a worthy goal.

If you look at the kind of progress this country made since the G.I. Bill, we made strides and then stalled in the 80s. We need to have the angle of trajectory change dramatically or we're going to continue to have a lot of unfilled jobs and a lot of jobs just being sent outside the country because they can't be filled here.

In my mind, it really takes the private sector to help push this because we're saying- look, we have all these jobs and we can't fill them. And rather than just be cranky about the fact that we can't fill them, we're actually working with models like P-TECH and others, and saying- we're willing to engage in new and different ways.

JEAN-CLAUDE BRIZARD, SENIOR ADVISOR, THE COLLEGE BOARD

What made you feel the most connected to your college early on?

After the first 18 months and going into the end of my second year at Queens College, I connected with a group of peer advisors through the peer advisement program and I joined the program. That's when I became more connected to the college, the people and the work. Before that, I was just going to class. But after that, my college experience became much more interesting.

Did you find anything difficult about the transition from high school to college, any moments where you couldn't see your way through it?

I graduated at the top of my class in high school. I was an immigrant, and so accessing the university system was foreign to me and foreign to my parents, despite the fact that they were both educated people. One was a teacher; the other was a school principal in my home country, so we had no understanding of the American educational system. We relied on a guidance counselor who basically pushed us toward the City University of New York. I don't regret the decision because I had a great education at Queens College; nonetheless, I had the grades and capacity to go to any Ivy League school in the country.

When I got to college, I expected the same kind of dynamic I had in high school; a little bit more hand-holding. When I got to Queens College, majoring in Chemistry, I didn't really understand college. It took me a full year to really understand how to access the systems, who to talk to and how to make the right decisions. So, the first year was quite interesting and frankly I'm surprised I survived it. There was no support structure that I was aware of.

What was it about college that was such a shock?

The amount of academic work was not intimidating. I learned the first year that I had to study. That was a bit of a shock, but it was not overwhelming. My studies were very important to me. What was challenging for me was that I expected someone to show me how to register, which classes to take for my major and what electives I had to complete. Instead, for the first two years of college, I didn't know there were liberal arts requirements in addition to my major.

In those days at Queens, advising was not available to all or we did not know how to access the advisement system. So, I just took courses because they looked interesting and someone told me that I needed 12 credits in order to get financial aid. I was 16 when I walked into college. Being young and having immigrant parents who didn't understand the system was really quite challenging for me initially.

What was the difference between the college experience that prepared you most for your career and what you thought at the time was preparing you?

My goal and my parents' goal initially was for me to be a medical doctor, so I knew I had to major in one of the sciences and then go to medical school. I got my degree in chemistry and went to look for a job, but I was not prepared at all for what I had to do when I finished college. I got a rude awakening that a four-year degree in chemistry does not prepare you to be a chemist. There was no talk of career, no education-to-career conversation, nothing around non-cognitive pieces I had to understand for résumé-writing and interviews; none of that was part of the conversation.

My parents helped me to get a résumé and I began looking through the newspaper for jobs. I'd walk in and everyone asked me about my experience. The only place willing to give me a shot was called Underwriters Laboratory on Long Island. When I got there I realized that I was going to be a bottle washer, an assistant to someone else doing the work, and I was really disappointed and disheartened.

Eventually, I ended up pursuing a job as a teacher, but nothing whatsoever in my college experience prepared me for anything that had to do with a career.

Where do you think that American will to advance into postsecondary education came from?

Even though we were immigrants, I think our will (to achieve higher education) aligned well to the American experience and expectation. Simply, my parents wanted me to do better than they did. They wanted me to have a profession, which meant going to professional school beyond college. For many parents, it's the idea that if you really want to have a profession and make a living wage, you have to do that. My parents especially were the kind of people who believed that.
At one point, I was very interested in becoming a police officer. My mom's push was not about the danger of the job, but she did not think it was a profession. And, for them, very simply, if you want to make a living wage and be a professional, you need to go beyond college to a professional educational program.

That belief is still out there. It's an interesting irony that people who make the argument that not all kids need to go to college would not accept that situation in their own families. There is a perception issue where people who have gone to college expect their children to go to college.

When did you start examining the changes made to the American education system, particularly in the 40s through the 60s?

It didn't happen as a teacher or a student, but as a school administrator. In the 1940s and 50s, the idea of equity and access didn't really exist. People began to realize that high school by itself was not sufficient, although there were quite a few industries that still existed that allowed a large enough number of kids to access jobs, not careers, but jobs that did not require a postsecondary education.

You've been focusing a lot on family and parents, but I haven't heard you mention policymakers, politicians, or the political system.

Politicians, maybe not all policymakers, seem to react to the rhetoric du jour. Many of them react to what they're hearing and seeing. So I think the culture that we have within our families and communities is what drives the conversation.

In Montgomery County, one of the best (school districts) in the country, parents stack up the number of AP courses that kids take. A lot of what I see tends to grow organically from parents' perceptions of what is needed for their kids to be successful and school districts tend to react to it.

The same holds true on the other end of the spectrum if you go to a very poor school district. The college conversation is not universal and few folks talk about what happens after high school. They all focus on high school graduation as if it was the end-all be-all. The community and the neighborhood, the kinds of kids you have, how poor they are- these types of things tend to create the cultures that schools and districts respond to and force policymakers to push for change.

Over the last four decades, high school performance has leveled-off, college enrollment has dramatically increased, and college completion has dropped. Are we experiencing a college readiness crisis?

About 74 percent of our kids are pushed into four-year institutions and I believe four-year college graduation is somewhere in the 30 percent range. There is this myth, this expectation that every child will go to a four-year institution. Meanwhile, few people are looking at what a kid wants to be, what it takes to actually get there, or even looking at stacking credentials, or programs that we need to put in place so that a kid can have multiple entry and exit points throughout their education and career. Not every kid needs to go to college but every child needs to be college ready.

The College Board is debating this whole idea of transitioning from education to a career right now. What do we need to begin to push, and how can we enter this conversation to address the skills gap in our country? Right now we have too many young people walking into these institutions underprepared for the level of rigor that they will experience. The readiness issues tend to hit our two-year colleges hardest for a number of reasons. But, when you look at the traditional college students who are dropping out, and remove the money part of the equation, I think you'll find that most are leaving because part of their academic preparation. At the same time, there are students who go to college because of someone else's expectations. Maybe it's their parents or society, but it's not their own idea. They take classes aimlessly, not knowing what to do, until the aid or money runs out or their will runs out.

What are the challenges for colleges and universities, and have they kept up with changes in the student population?

The short answer, in my opinion, is no. We blame K-12 for everything, but universities are just as responsible. K-12 owns some of the issues, but at the same time, no one ever really defined what kids are supposed to do when they get to college.

If you could radically change the system of higher education, what would you do?

I would require every entering student to have a six-year plan. What is it that you are going to be doing two years beyond graduation? Begin to help people connect a career to education. Help students frame what career they're thinking about going into, being careful not to pigeonhole someone into a particular track. If you are the higher education institution, you need to understand what the student is going to be doing for employment post-college because every school program should eventually lead to a career. The post-college employment plan should map back to what you're going to do in four short years; what classes you need to take, et cetera. So, somehow, the higher education institution that we'd create would not just be held accountable for someone to be well-rounded, but, certainly would be one that would prepare someone for a career.

There's also a responsibility for higher education to make public and publish the trends in the labor market that will help students prepare. I think it is unfair for students to come out of college with $100,000 or more in student loans, and then find out that they cannot get a job.

I'm also an advocate of looking at how we do career-readiness in high school and how we inform kids about their choices, even opening their eyes in middle school. I think that's all part of the work we need to do to begin to address the whole education and career issue in this country.

How should the higher education system adapt to this population of people who have some college or are older adults?

Any two- or four-year institution that can help someone get back on track should help them define what they want to be, what they're going to be doing, and put them on a pathway to actually get there. Most of these people are looking to get some type of credential to enhance their career. So, there is a huge opportunity for higher ed and for those two-year institutions that tend to be more focused around careers. Take these people and say- I can offer you a pathway to the following (career) if you are interested, or what is it that you want to do? And given that, here's what we have to offer.

I think four-year institutions can offer the same things as well. They can provide the same kind of system or they can adapt to or plug-in to a two-year stackable credential program that can build into a four-year institution program. There is a huge opportunity to re-engage these people.

What does it mean to be college-ready or career-ready? Does a high-school diploma actually make you college-ready? What's your view of the GED?

The GED doesn't always demonstrate academic preparation. At the same time, the commitment to see a four-year program through is important. I'm not advocating we get rid of it, but, certainly, we need to look at it again.

In terms of the high school diploma, what we have today barely prepares kids for rigorous postsecondary work. There are exceptions, of course. But there is no consistency from state to state about high school curricula, expectations and graduation requirements. Unless you are measuring the mastery of standards in a way that's consistent, with similar goalposts across the country, you can't say you're comparing apples to apples.

ALBERTO CARVALHO, SUPERINTENDENT, MIAMI-DADE COUNTY PUBLIC SCHOOLS

What made you decide to get a Masters in Educational Leadership?

My favorite classes during my undergrad years were science classes – chemistry, anatomy, physiology, biophysics – they really excited me, and I did well, so I thought I'd pursue a career in medicine. I felt my forte, though, was an ability to communicate; visualize a condition and accelerate a movement towards that vision. So I abandoned medicine for education.

I spent three years teaching and every one of those years was marked by both exhilarating instances of student achievement and the very harsh environment in inner-city Miami. Those years were marked by incredible disappointment over the structure and architecture of schooling in America.

I'd graduated from high school in Portugal, one of the poorest countries in Western Europe, and after emigrating to the U.S., I realized that education here was lacking. It was not a skill set deficiency. It was a will set problem. Everybody knew exactly what needed to be done – they just didn't have the passion or the desire to dramatically change our system, basically because of fear.
Fear of taking on unions, fear of taking on a school board, fear of taking on a school principal, fear that actually stifled the possibility of improving education.

I felt I could not change that sad reality from the classroom, so I decided to quickly complete all the prerequisites to position myself in a way where I could be a change agent.

When did the "will" to make big changes in education exist?

In the mid-40s, with the return of our veterans, there was a national drive to create learning opportunities. Many veterans became the first in their families to attain a college education. We had a critical mass of individuals with an education and, more importantly, an expectation that their children ought to attain even more education than they had. Never before in the history of our country did we have that critical mass of individuals.

I arrived as an immigrant to this country at 17 and my first job was as a day laborer washing dishes in New York and in Miami. Then I taught, I was a principal and now I'm superintendent. The level of education I have attained is now the floor for success for the generation that will follow me, for my daughter.

World War II itself exposed deficiencies in American education at all levels. Millions of draftees initially were rejected by the Army because they were illiterate. At the more specialized level, our universities were found wanting. Foreign language and scientific training was inadequate, and college graduates were poorly equipped for global leadership.

Tell us about the term "demand-driven reform".

Well, the only sustainable reform hinges on exciting or igniting popular discontent with a current reality. Students won't really complain about the quality of education, but if you show parents what education could be, they will get very angry. My mission has always been to expose the inadequacies of my own system as a means of creating the demand to drive the reform.

If you could start with a clean slate, how would you reinvent the hand-off between high school and college, where we lose so many people?

I struggle with the construct of the school year and grade level segmentation as we have it. We believe that organizing schools by kindergarten through fifth grade, and then sixth through eighth grade, and so on, and shipping them to bigger buildings at each stage is ideal. What I know is that people are accustomed to accessing information, communication and entertainment in a much more self-paced way that is directly in agreement with our own personality. This goes for young and old people and how they learn. These phases of education – they're chasms, really – are not aligned with the way people live today.

The whole experience is not personalized enough, and our students are entering and leaving high school with a huge disconnect between what the workplace will require of them. If you go to a high school and ask the kids—and I do this all the time—what will you do after 12th grade, sadly 50 percent of the kids will tell you they're going to play ball, and 50 percent of the kids will tell you they're going to be attorneys or doctors. Those are the three answers that I get the most. And we just got the Broad prize, so we are presumably among the highest performing urban districts in the nation. So I can only imagine what the answers are in other districts.

The issue of greatest concern to me is that at no point do they consider other viable, legitimate and logical career goals because they were never exposed to them during their first 12 years of schooling.

To a lot of students, college appears to be another rite of passage. I don't know that enough of them recognize the long-term, life-long implications. Nor do they understand that even a two-year high-end technical program—much like they have in Germany and England—or apprenticeship programs are incredibly valuable. We've demonized career technical preparation, and we've elevated the worth of college, but we haven't really explained either pathway to young men and women very well, and they're understandably confused.

Are your counterparts in higher education meeting you half way?

I don't know of any other district that has been able to create a partnership like we have with our local universities. Florida International University president Dr. Mark Rosenberg and I agreed to a common agenda and partnership, approved by my Board and the Board of Trustees of the University, which we call "ACCESS", Achieving Community Collaboration in Education and Student Success.

We meet every quarter. That meeting includes our entire cabinet and the University's entire leadership, and we agree on a number of things, including new enrollment programs, so there is a direct pathway between high school and college, but it begins in high school.

We are now opening schools together to blur the lines between where high school ends and where college begins: everything from new infrastructure and technologies, world languages, bilingual education, articulation, clinical internships, and pre-collegiate preparation to address the issue of remediation in college. Our success will be measured by the blurring of the lines that separate 12th grade from freshman year of college.

Are you getting the same level of enthusiasm and willingness to join you at the table from the private sector?

The local private sector is joining us. The private sector joined us aggressively from the onset because the economic development arm of our community conducted an economic study that identified seven key industries that will require

a skilled workforce in the next five to 15 years. To do well economically as a community, not only do we need to attract businesses to our community, we need to have a workforce that is trained well enough to fill those jobs, and have a strong enough school system to attract companies to relocate to South Florida.

What that meant for Florida International University and for Miami-Dade County Public Schools was a clear recognition of our seven key industries and an alignment of educational programs, and seamless pathways—particularly from the secondary level, middle school, senior high, and university—that would lead to each one of those seven specific areas. Are we there yet? Absolutely not.

But we are on the cusp of having clear pathways that begin in the first year of secondary education, in sixth grade, that proceed all the way through the 16th grade.

What advice would you give another high school superintendent or leader at a community college?

First, concentrate on what's under your control. Do a deep, honest, introspective look at your organization and ask the tough questions. How qualified and how effective are your teachers and your leaders? In Miami Dade, I replaced 64 percent of all principals, and we are the fourth largest school system in America. That's a lot of principals.

Next, how rigorous is your curriculum? Do you have enough advanced course offerings? If it's about college and career readiness, then you ought to have these mandates in every one of your high schools, have no fewer than five or six different advanced placement courses being taught in every one of your high schools, and poverty and diversity cannot be excuses. We have that in Miami Dade. For a while we had to fund classes with just five or six kids. But digital content allows us to spread the resources without breaking the bank.

We invested heavily in creating career academies in high school with support from the business community. Right now in Miami Dade, close to 50 percent of students are in nontraditional school programs.

Demand-driven reform is important here. What parents want is aligned with the economic needs of our community. Let's deliver it. Identify the best-selling programs, and franchise them. Escalate and quickly scale-up the best programs. Invest in student services support to prepare students to be ready for college. On the other side, move away from the elements that bankrupt the school system without providing value in terms of student achievement and college career readiness. Move away from traditional textbooks and traditional resources to digital textbooks, virtual and distance learning.

Breakaway from 180 day schooling, seven hours and 20 minutes a day, punctuated by annoying bells every 60 minutes. That's not the way that kids learn. Some need a lot less. The school system ought to be a portfolio, an array of opportunities. Deviate from the "one size fits all" educational model.

Use technology that affords you anytime, anywhere learning to provide instruction. And enlist help from state legislators and local governments to provide students with the appropriate tools, digital content devices, and individualized and personalized instruction to guarantee acceleration and remediation.

If you do that, you have imploded the system as we know it, and you will have created something that dignifies and exemplifies educational opportunity for kids.

You're not using the word remediation that often.

You're right, and you know why? Because remediation is a sad conclusion that the patient has already died. Everybody knows that; it's a crisis in America. And usually the colleges and universities blame the K-12 program, the K-12 program then blames the college and universities for the quality of the teachers that they produced, and it's a vicious cycle.

Remediation, the way we usually define it, is something that happened after the fact. A student gets to 12th grade, and didn't quite make it, now he's in a 13th year program to try to catch up. That to me is a catastrophic failure of a system that did not identify early signals of learning deficits or readiness that sometimes can be traced back to preschool. That system did not adequately personalize the education for that child with the necessary support system before, during and after school, with digital content that instructs, assesses and remediates simultaneously.

And it's a system that's also broken down because we expected for this child to somehow get better by throwing him the same thing that failed him to begin with. That's why I believe that everything we need to know about reforming public schools, about increasing graduation rates, about decreasing dropout rates, we already know.

It's not a skill set deficit. It's a will set deficit. It's policy makers, unions, leaders, boards. It's doing what's best, what's well researched and documented and what will dramatically improve the learning of students.

And if we do that, not only will we change the architecture of schools, literally and figuratively, not only would we change the curriculum, not only would we change what we deliver, but we would change the way we train teachers, we would change the way we pay teachers, we would change the way we compensate leaders, because there are better ways of doing this work.

There's just a huge distance between what we know works and what we dare to actually put to work.

LISA NUTTER, PRESIDENT, PHILADELPHIA ACADEMIES, INC.

How did you come to choose Penn State? And what connected you to the school?

I was a really good science student in high school and was looking for a university that had a good program. Penn State had that, and I was familiar with the University because my parents had gone there. It's the school I feel most connected to, probably because like most people, undergrad is where you feel more allegiance, more than my grad school UPenn.

But I was not able to stay in the science department at Penn State. The way they taught science was completely unfamiliar to me. In high school, most of the science classes were very hands-on. We understood science by doing science. At Penn State, I was sitting in an auditorium of 300 to 400 other students. I couldn't tell you what my chemistry or biology or biochemistry professors look like. All I can remember was the glow of the overhead projector. And I was never the kind of person who was going to admit I didn't know something in front of 300 people. To raise my hand and ask a question wasn't really going to happen.

Also, I was in the largest African-American class in the University's history, as a result of an intentional effort to increase diversity and inclusion. For a number of minorities on campus, there was this feeling that people thought you didn't really belong there. Penn State's typical pattern is to go to one of the branch campuses somewhere in Pennsylvania, and then you actually don't typically come to the main campus until your last two years of school. They only bring freshmen to the main

campus if they think you're bright and can really handle the work and being away from home. So, just under the surface, I felt—and I know a number of my black friends at Penn State felt the same— like we had to prove ourselves and prove that we belonged on the main campus.

Sounds like a tough transition.

Yes, my transition was pretty difficult academically and socially. But one of the things the university did have was a focus on retention especially for minority students. So, in addition to the counselor you had in your department, you also had this other counselor who was focused on keeping you there. I don't remember the guy's name who saved my life, but I do remember his face. And he's probably the first person, as I was getting kicked out of the science department, who really sat me down and helped me explore my goals, my passions and my interests. No one had ever explicitly sat me down to talk about a career pathway, goal setting, and figuring-out the right learning pathway to those goals.

It was the end of my sophomore year, I'm about to flunk out of school with a lackluster GPA and in need of a place to transfer. So the first thing he said was- so now let's get you out of here. We had a very pragmatic and grounded conversation. Somewhere between the pragmatic idea we've got to get you out of here in an appropriate amount of time and the question what do you love to do and what do you care most about, we figured out a place for me. It turned out that in this exploratory conversation, I discovered that I do love science, but not the department so much. I also discovered that I love people, I love observing people and I love understanding people. We started to talk about psychology as a science that's about people. Ultimately I transferred into the psychology program, another strong department at Penn State, with an emphasis on organizational psychology. It was a degree that I never thought I'd use again, but clearly I use it every day.

Without the assistance of my counselor intervening and scooping me up, and helping me get refocused, I'm not sure what would have happened to me.

What do you see as some of the most important changes in education? Are we facing a college readiness crisis today, and if so, how did we get here?

We tend to let young people fantasize about their futures for way too long. One of the things we focus on at Philadelphia Academies is practical conversations with the support and guidance of positive adults.

Where higher education needs to move is towards an educational experience that is more project-based, more experiential, and reflects more of what happens in the real world and how it functions. We can have classes where we sit and talk extensively about philosophy and all those things, I'm for that. But at the end of the day, for the amount of money that you spend attending college, it needs to be preparing you for professionalism as well. Overall, I haven't really seen those shifts in most higher education institutions.

If you could reinvent the higher education system and had a completely clean slate, what are some things that you might do?

We should be more focused on interdisciplinary approaches to education, focusing on case studies, solving actual problems in industry or social issues, et cetera, but using real material as the basis for the educational experience. If we're really trying to prepare people to enter a world where we need them to be good problem-solvers, but also be open to innovative solutions, then let's break down the silos.

Any thoughts on how high schools should reimagine their current structures?

I would start with the physical structure. Many of them are too big for any adults to build relationships with kids or for kids to build supportive relationships with one another. Let's break them up into small schools within schools. These structural things matter a lot. We hear it from kids all the time that they like having a separate space, their Career Academy, and that's where they go. It's their affinity group.

Young people, ages 14 to high school-age and a little older, really need this kind of very supportive environment as they enter these transitions. This time represents our last chance to get it right with them, so the relationships and the structure have to be right.

And then the rest would follow suit with what I've said about higher education. My observation is that most people learn better when they're learning hands-on, when project-based instruction is incorporated into what they're doing, when they're able to take what they learn in school and actually practice the skills outside of school, that finally they have a context for learning these things.

Could you speak a little to how today's higher education system is or is not serving the needs of those people who are less prepared going in?

There's a body of research about people who have had to overcome difficult circumstances to succeed, and they're called resilient people. What they've learned about these folks is that they are hyper-focused people. They have a set of goals that drive them. The other thing about those people is that they tend to have a sense of self-efficacy. So, they believe that they can shape their world against the possibilities. The third thing they all have in common is that they have at least one positive adult in their lives. So I'm not talking about 20 mentors, I'm talking at least one positive adult that mirrors these high expectations for them and helps keep them on track.

None of those things cost a lot of money. High expectations don't cost anything, last time I checked. It just requires an awareness of the kinds of inputs that we have to focus on to build resilience in people. I'm not saying everybody is going to have the same result and pop-out a resilient person if given high expectations and a mentor, but I am saying that it deserves an experiment.

We focus on these things here in Philly and we do see very different results. We see young people make the transition to college with a sense of purpose, with a sense of clarity about why they're going, and even a strong sense of their major, even if it changes. But they have a rationale behind it. And this is important—there's an experience to support that rationale.

We've found that if we can focus on those resiliency factors and give kids this contextualized experience in our communities, we not only build community around their goals by using volunteers and informal mentors, but they get clearer about them through the experience of others. Also, their own work and internship experiences are really focused on helping them explore different careers and career options.

What types of programs do you use to cultivate the skills needed to attain desirable jobs?

We use careers as a theme to help create Career Academies. It creates a hook, especially for populations that are very disconnected from this economy. What we want kids to focus on during this period is to understand who they are, and then set goals and create a pathway that we can support as they attain those goals.

There are some universities here in Philadelphia that do a better job of that than others, Drexel because of their co-op model, and a smaller university called Philadelphia University, which is experimenting with an interdisciplinary curriculum in the freshman and sophomore years. You can obtain a number of very technical degrees there, engineering being one. A number of their students are getting nervous that if they keep taking interdisciplinary, competency-based classes, they'll never get to their major and they won't be ready for their specific career. There's something wrong with that! They need to see that working in interdisciplinary, hands-on project teams is an important educational experience.

Are there some examples of companies that are doing particularly well in partnering with higher education? If you were to talk to businesses, what would you say is their role in this part of the conversation?

Their role is to be clearer about what they need. The real issue is the set of 21st century skills we've all been talking about for a while: problem-solving, collaboration, leadership. These are real competencies. They're competencies in higher education, although they talk about them differently and treat them differently.

Businesses need to do a better job of being more explicit about the types of skills and competencies they need, and what constitutes mastery of those skills. It takes the conversation to a different place when you talk about mastery. Everybody has heard about 21st century skills, and they're built into the Common Core, and everybody is trying to figure out how to integrate them into the school day. But no one has defined mastery of these skills.

Do you have any thoughts on how to frame a challenge, whether it's a research question or a pilot project that could solicit a practical solution?

We've looked at readiness for a long time. Beyond readiness, we're now very focused on postsecondary completion. Not just four-year, but postsecondary education completion.

There are a couple areas where colleges seem to be challenged. Retaining someone in the first year seems to be a big benchmark for folks. At the universities we've been working with, the first semester retention looks pretty good, first-year retention looks good, and even second-year retention looks good.

But, when you look at whether these college students have the minimum GPA to graduate, the number drops precipitously. Then, when you look at whether they have the minimum number of credits to graduate, it really drops down. So you begin to see why there is a huge pipeline at the top, but then when you get to year four, very few people are graduating.
So I think the challenge for universities is really following what's happening in the pipeline. We're just guessing that the reason people have too few credits to graduate on time is because they're probably entering the pipeline behind, maybe taking many remedial courses that don't count towards graduation. That's one theory. Another theory could be that some people are working so many hours that they can only attain so many credits.

I think it's really important to get into the nitty-gritty of these issues and think about groups of students as a pipeline- to try to understand where you're losing them and why, and then design interventions to deal with it. The program I was a part of at Penn State is a good example. I know for sure I would have dropped-out if it had not been for that man who helped me stay in college. I know it. I was at my lowest. In order to figure out what the right intervening moments are for students today and what the right interventions are, you really have to study the pipeline. We're beginning to understand that here in Philly.

There's another challenge we're looking at. Over the past 10 years, we significantly increased the number of kids who apply to college or postsecondary ed, and we managed to also increase the number of kids being accepted to postsecondary ed.

But our enrollment numbers are flat. What's going on between application, acceptance and enrollment? If we are serious about people enrolling and completing postsecondary ed, we have to understand what is happening between those stages. If we can get them to apply and even get many of them accepted, why aren't they enrolling?

It goes back to the pipeline issue. Until we get into the minutiae, we're not going to solve this problem. We can keep designing all the big-picture initiatives we want, but this is about the details. That guy who kept me in school was a detail that somebody thought about.

These are the kinds of challenges we're dealing with in terms of postsecondary ed completion. I'd encourage you to come out here to learn more about what we're doing in regards to college readiness and college completion. It's been an all-out community effort and it's also been a collaborative process.

MARGARET SPELLINGS, FORMER U.S. SECRETARY OF EDUCATION

Tell us a little bit about your personal educational and early work experience.

I am the oldest of four girls – we were all born within five years of each other – so many of us were in college at the same time. My dad had a Doctorate in Geology and my mother had a Master's degree, so they appreciated education but affordability was certainly an issue. I lived at home and commuted to the University of Houston for most of my college experience, with the exception of attending Texas A&M for one semester. I was an office cashier at a large grocery store chain and made, what was at that time, a lot of money in Houston, Texas in the late 70s.

I was a political science major, and the way I picked my major (and I probably shouldn't tell you this), is that I looked in the course catalog for the major that took the least amount of credit hours to graduate, and that's how I decided that Political Science was for me. At least I had my eye on the completion ball!

Commuting was the way of the world at the University of Houston, and still is. There was a lot of peer learning because most of the people were also employed and had lives outside of college. I also attended a community college along the way, like most people these days, and I ended up having credits from three different institutions to get my hours to graduate.

I remember feeling pretty disengaged from the faculty. It was a state institution with very large classes. Tuition was around $250 a semester, textbooks were the same amount, and our parents wrote a check for it every semester. It was affordable, but it was not customized. Nor did anyone have any expectation that it would be, by the way.

As you were commuting back and forth, what made you feel more connected to the school?

I was trying to decide whether I was going to major in journalism or political science. Everyone was assigned a beat in my journalism class, and I had the campus police. I regularly interviewed the campus police about shenanigans in the dorms and broken windshields, which made me feel marvelously connected to the campus. But, more importantly, it was the people – my fellow students – who made me feel connected to the campus.

What aspect of college most prepared you for the sort of work that you did moving forward? Was that different from what you thought was preparing you?

If somebody had told me in my college days that I was going to end up as the Secretary of Education, of course, I would

have laughed hysterically. In some ways, I learned at least as much from working through college and high school as I did in school itself. They were mutually enforced by the fact that I did them in tandem. In Journalism and Political Science, I had to do a lot of reading and writing and thinking. But the problem-solving required as a supervisor was extremely valuable. I learned how to work with people.

What changes did we make in the 40s, 50s and 60s that most expanded access to higher education?

Going back before that period to the Morrill Land-Grant Acts of 1862, which created our great land grant educational institutions, we've recognized that higher learning was going to be a part of this nation's expansion and development. We've used the tools, infrastructure and capital available to us in each successive wave. In the 1860s we used the land. That was an early, and historically significant, federal role. Fast forward to the 40s, 50s and 60s with the G.I. Bill, its aftermath and what it meant to our country to expand the American dream into the middle class. We were making new investments in new educational infrastructure and building new human capital.

The same could be said today. What we observed on the [Spellings] Commission on the Future of Higher Education is that now we have to look at different models to reach further into different populations. It requires change, and it's quite controversial.

Of course, the Presidents of the University of Chicago and Harvard thought the G.I. Bill was a bad idea- to have the masses milling about in our institutions of higher education, which, of course, originally were reserved for elites. But that argument certainly didn't play out that way, as we all know.

Where did the political will come from to transform ourselves as a society?

We had won two wars. We had confidence. We had the ability to make massive allocations of human capital. And, we had just enough foresight to realize that we needed to find ways to re-channel that human capital. Though the country was clearly in a time of prosperity, we had a recognition that our future prosperity was starting to be as much about people as it was about machines and the aftermath of the Industrial Age.

What are some of the biggest college readiness challenges that have come up over the last few decades?

We've always known how to do a great job of educating elites and there was a time when that was all that mattered. The G.I. Bill leveled the playing field and challenged us to do something that we had never done before.

Here's the new challenge ahead of us. It's not about educating massive human capital coming home from the war. Now we have widespread poverty, an inadequacy in our K-12 systems and we've denied the dream of college to far too many people. All of that adds up to a perfect storm. Affordability and financing are huge issues. Add in a changing global marketplace that has redefined what the labor market needs and we have some thorny problems.

Have we reached a crisis?

Yes, I believe so. I'm not usually one to use hyperbole. It's certainly a crisis for the people who are being denied access to the American dream because they don't have the necessary skills. This is playing-out over and over and, more troubling, generation after generation. We have millions of jobs unfilled. The research shows that the rich are getting richer while the poor are getting poorer and that gap keeps widening.

Do you feel that higher education has kept pace with these changes?

Have some struggled to keep pace and are more people engaged in the discussion? Yes. But what's creating the real change is the unsustainable nature of financing and funding. I'm not sure that we'd be having this conversation if the good times were rolling in the economy. Higher education was rather complacent, in my view, given the fact that far fewer were getting in and out of college. I think the funding issues have precipitated greater interest in the academy than the lack of access and affordability for students apparently has. There's a renewed understanding that "change or die" is minted on the coin of the realm.

Where should we be improving?

I think we got used to the notion that one system of higher education could be everything to all people. But it's expensive, and frankly, unsustainable. We're now seeing and understanding this, which should have happened in the first place. But, we didn't have to deal with it because the money was there.

We used to talk about higher education as a system. That's not accurate. We've got numbers of systems. We've got research university systems, we've got a community college system, we've got a career and technical system and we've got a liberal arts system. We tend to be too monolithic in our thinking.

We have to be better coordinated with our K-12 system. But the important missing piece is the changing interests and needs of the demand side, of the employer community and the student community.

If you were able to start with a clean slate, what changes would you make?

Our country, from the states to the federal government, ought to have an overt strategy. And unlike K-12, we don't have funding systems that are aligned around any kind of strategy in higher education.

I would think about how we could better instill, build and finance more differentiation and segmentation in this marketplace. I'd price college differently. We're going to have to be much more open and transparent with data and information with our clients, whether they're students or employers.

We need to enhance transparency and information, because the truth of the matter is that we don't know a lot. There are so many questions that we have no idea how to answer. So, we need to start with better, more useful information. And this is an area where the for-profit sector has an advantage because of their ability to tailor and adapt to data. That seldom occurs in traditional higher education.

I'd want to see accurate completion rates disaggregated by type of student and type of major. I'd like to see an analysis about post-employment outcomes. I'd like to see data about time to completion. So if I was a science and engineering student in Washington D.C., interested in the engineering program at the University of Texas and Ohio State University, I could make some value judgments about affordability, completion, and post-employment prospects.

The business community needs to be better and more engaged in the guts of these conversations.

How do we get smarter about the kind of weight, validation, authority and credibility that the employer community broadly has to try to provoke some of these changes?

DAVID STERN,
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Was there anything in particular that made you feel connected to your college?

When I was in college at Harvard, I got involved in a social service organization that provided after-school tutoring to kids in a public housing project. I became the director of a summer program we ran for kids from the Roosevelt Towers Housing Project; that was a pretty intense experience and responsibility. We had around 60 kids, five days a week, and there were just six of us undergraduates responsible for running the whole thing. I was the least able to deal with kids, so they made me the director. I was the one they had to see if they were in trouble. It was a lesson in real life. I had to enforce sanctions on kids to keep them in line, and they generally behaved very well.

I had very positive and productive experiences with this little team of students running this thing—planning it, organizing it, troubleshooting, hanging out afterwards, and that was a real coming of age for me. I've had jobs before, but it was never anything where I was really in charge of part of the group that was running the show. That was really important, and I feel that was probably the most important thing I did in college.

What aspect of college most prepared you for your career?

To be overly brief, nothing. I went to a very demanding high school, a prep school, with a very rigorous academic program. In college, I never really could understand the point of large lectures, and they tended to put me to sleep. In the mid-70s, there was a dramatic shift towards career motivations for entering freshman, but I was in college before that so it wasn't really the norm for me. It wasn't so much college as it was graduate school that prepared me for my career. I ended up going to graduate school in city planning, because I had this vague notion of wanting to build a more just society, and that was, in fact, what I said in my first professional job interview. They asked me what my career ambitions were, and I said I wanted to help build a more just society. I guess that was considered an acceptable answer because they gave me the job! I realized I wasn't a good community organizer, so I went back and studied economics eventually, which gave me some technical training that I could trade on as an academic.

How was your transition into the workforce?

I wasn't quite sure how I was going to make a living. The last thing I ever wanted to do was go back and live at home and be dependent on my parents. I got fellowships all the way through graduate school. I had enough to live on, and I pretty much launched into a career after I graduated from college. I was paying the rent. Of course, I was still a student, but I understood that I was now gearing-up for a profession. So I went to teach in an economics department, but I left because it wasn't applied enough for me. I didn't really want to spend the rest of my life writing papers for other economists, so I ended up in the field of education, and that's been much more satisfying, because you get to straddle practice and research, and that's been a much more congenial mix for me.

What were the most significant changes in our higher education system that expanded access and opportunity in the 1940s, 50s, and 60s?

The G.I. Bill. It was huge in the late 40s and early 50s and sent what they now call the greatest generation to college. A lot of guys who wouldn't have gone to college were able to go and did go. In the 60s, around the time of the first Higher Education Act, Upward Bound was the first college outreach program. It was part of the war on poverty.

People realized that access to college was very unequal in class attendance, and so Upward Bound was one of the first—if not the first—publicly-supported, federally-supported college outreach program. Some longitudinal surveys started in the 60s that helped provide some of the factual basis for understanding inequality in college access. After Upward Bound, outreach programs started growing into what is now a fairly large industry.

Was there a public consciousness about the need for change? Was it driven by public demand, or were politicians leading the charge?

There has always been some degree of contradiction between our egalitarian ideals and the reality of class and race, and equality. Every once in a while people are in a mood to attend to these things or movements arise, like in the 60s, the civil rights movement, and the war on poverty. Lyndon Johnson finally got the Civil Rights Act passed, and then went to prosecute the war on poverty. It was probably, at that time, more racially-defined than class-defined. The two are strongly associated, and both continue to be dimensions in inequality that need to be addressed.

Are leaders leading from behind, or are they really leading? Or, are they articulating a will that's there but latent? There was opposition and it wasn't easy to get the Civil Rights Act passed. There was a lot of controversy about the war on poverty. The institutions and realities of sustained inequality are strong and so just throwing some rhetoric at them isn't enough. It takes power to make changes, and that happened to some extent. There was a decline in inequality, measured by income and some of the racial gaps from the 50s into the early 70s, and then that trend started to turn around.

What about college readiness and unprepared students today?

I'd say it's a problem and a waste. It's both inequitable and inefficient, and those are both social problems. Presumably, society as a whole would be better off if more students were more prepared for college, but I don't see it as really a crisis that has to be resolved.

Are universities serving students?

Something isn't working, so change has to happen somewhere if it's going to work better. I've never felt that colleges were really set-up as ideal learning environments. Why does college produce higher incomes? How much is actual learning and how much of it is just selection? The consensus is that it is some mixture of the two.

It's a mistake to think that college is nothing but selection. At lower levels of education, high schools have the problem that some students have the responsibilities of full-grown adults, especially the older ones. They are active in the work world, holding jobs to pay for school or sustenance, and they have adult characteristics. Yet they're treated as kids, seated in classrooms in rows and told what to do every minute of the day.

You could describe the higher education system as a large sorting mechanism that is very stratified by selectivity. In the most selective and highly competitive undergraduate institutions, they don't let you flunk out. For example, it's really, really hard to flunk out of Yale. I taught there for a while, and I was really impressed that if somebody's unhappy there, they don't quit; they just leave for a while. They stop out rather than drop out, and they're invited back, because the institution wants to sustain a high completion rate. That's part of what justifies its high rating, and its high rating attracts a lot of applicants, and attracting a lot of applicants allows them to be highly selective, which also contributes to their high rating, and so that's how they adapt. That's the behavior at the high-end of the selectivity spectrum.

At the low-end, there isn't much selection. The vast majority of undergraduate institutions take all applicants and there's little or no selectivity. Basically anybody who applies with the minimum criteria gets in. If you look at any college guide to undergraduate institutions, you'll find that most institutions admit close to 100 percent of applicants. Some kids don't want to work very hard, and if they don't make it, there will always be more applicants. That's how institutions survive at the lower end of the selectivity spectrum.

If students get nothing out of going to college for a year, then I suppose that's just a waste of everybody's time. But you could argue that they get something out of it, even if they don't complete a degree. They may at least learn that they don't want to go to college, or that they aren't going to survive while there, and they may find something else to do. In what sense is it really inefficient? Because the presumption is that all this behavior is voluntary, and people are getting what they want. That's why I don't see this as a crisis. I see it as a problem.

A lot of kids come out of high school and don't have a clue what they want to do, and they go to college because they think they should, or their parents think they should. It's part of growing up. If they don't finish college, there are so many second chances in this country, that it's not clear to me that this is always inefficient. It's probably inequitable, because we know that the kids who are less likely to finish college are the ones who don't have the social capital or the financial capital; the ones who have to work 20 or 30 hours a week to sustain themselves in college. I'd say that's an inequity issue.

You're doing a lot of work with college and career pathways or academies. How do they help address the kinds of challenges in education that we've been talking about?

The college and career academies that I deal with in high schools are attempts to promote the idea that by giving high school students a chance to be more proactive and responsible, you make it real. Learning the rudiments of reading and math and basic literacy in third grade, that's real. But in high school, you're marched from one subject to another; biology, and then history, and then language, and then English literature, and then math, and then P.E. It can feel artificial to a lot of students, and they're not shy about saying so.

High schools have tried a lot of things within the classroom and various kinds of project-based learning. The academies try to do it by using that kind of pedagogy, but also by connecting what goes on in school with something outside the school that is meaningful to the students, and it's all under the umbrella of some kind of career objective. It could be health professions; or it could be art, media, and entertainment; or it could be engineering; or it could be architecture and construction; or it could be public service.

Each of these pathways is identified with a different economic sector, within which students can think about involving themselves here and now through internships and other kinds of field trips, which even then turns into other forms of work-based learning and internships. Those are huge confidence builders, and it precipitates a sense in the developing teenager that I can do something. I can make a difference. Adults will trust me with some degree of responsibility, and that's a powerful growing-up experience, and it can motivate them to take a class like Algebra 2 more seriously.

Teachers offer personal support as well as academic support for their students, and that is very important for teenagers with issues or from households under stress. There's a more personal relationship that's part of this pathway experience. And then the peer group itself can turn around, because they stay together over some years. They become more like a team instead of a mob. Students get a sense that what they're doing now can be connected with a future. They have an experience here and now that validates that sense of their growing self, so they can see themselves launching into the world, or into higher education, but with some greater sense of purpose. It's a part of identity formation and it connects academics with the outside world.

We need more research on the postsecondary educational outcomes of students who've been through these academies and pathways. From an educational attainment angle, a landmark study in this field found no difference between the academy group and the control group; both went on to higher education at very high rates compared to other students in low income urban schools.

So there was something about the kids who applied to the academy that seemed to make them more inclined to go into higher education. Even so, the academy kids had substantial and significant gains and earnings. So the big payoff wasn't the economic side, it was on the earnings side. The academy kids did no worse.

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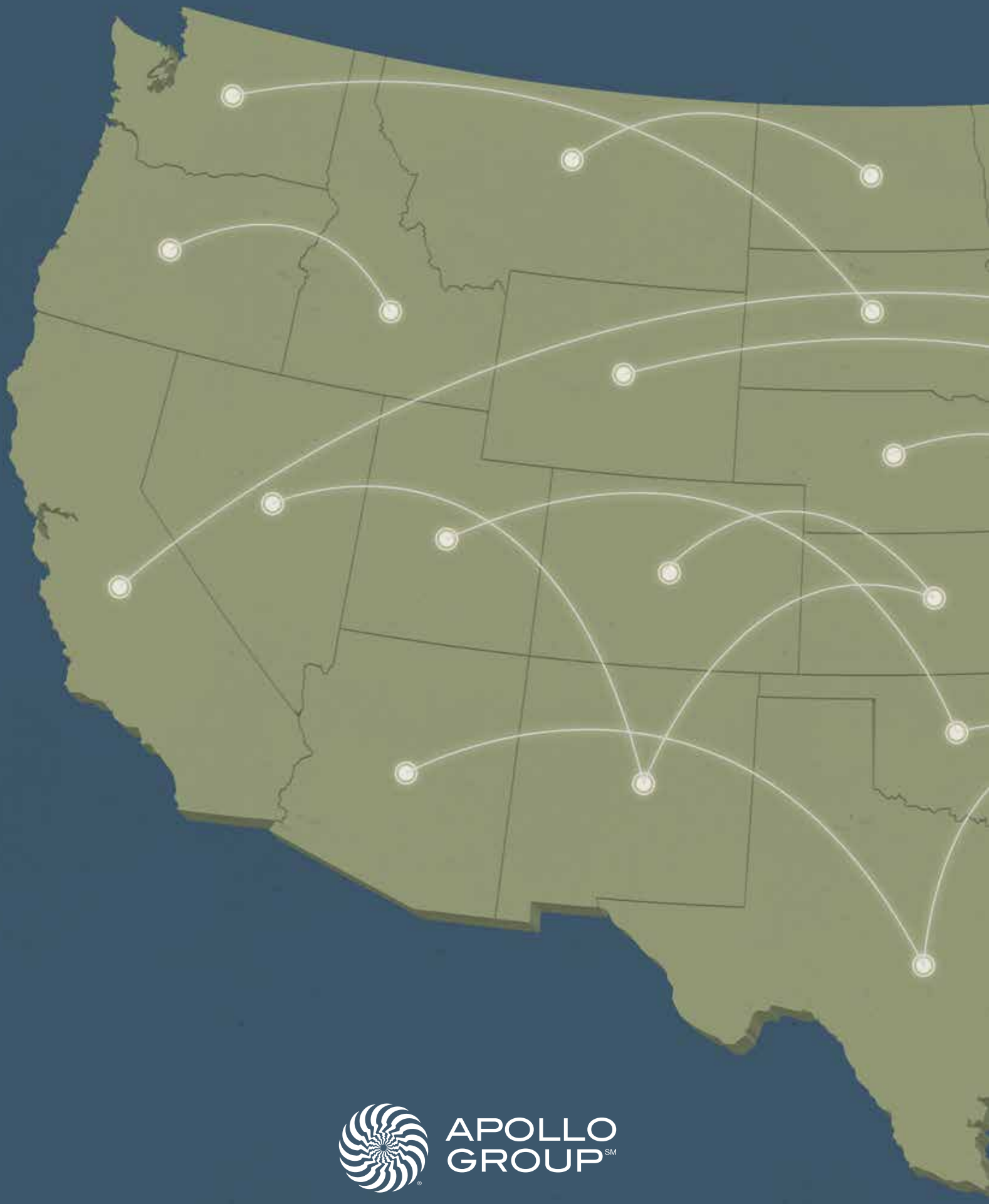
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