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Industry Study**

Final Report
Education



The Dwight D. Eisenhower School for National Security and Resource Strategy

National Defense University
Fort McNair, Washington, D. C. 20319-5062

EDUCATION 2017

ABSTRACT: Higher education is the fuel for US economic prosperity in a knowledge-based economy and functions best when people, processes, and platforms are aligned to achieve the nation's goals. Based on the connections between the constituents, higher education is a two-sided market, which faces challenges from information failures and misaligned incentives. These failures cause overwhelming costs, unbalanced employment opportunities, inadequately prepared students, and workforce gaps. Through increased information to students, alignment of high schools, post-secondary schools, and labor, and with improvements to the financial aid system, the US higher education system will create a more secure platform for the nation.

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Industry Study Outreach and Field Studies

On Campus Presenters

American Council on Education, Washington, DC
 National Governors Association, Washington, DC
 Council of Great City Schools, Washington, DC
 Education Testing Service, Washington, DC
 Education Trust, Washington, DC
 American Federation of Teachers, Washington, DC
 National Board of Professional Teaching Standards, Washington, DC
 American Public University System, Washington, DC
 Teacher Panel, Einstein Fellows, Washington, DC
 Home School Legal Defense Association (HSLDA), Washington, DC
 Marc Tucker, Author of *Surpassing Shanghai*, Washington, DC

Field Studies – Domestic

New America Foundation, Washington, DC
 U.S. Department of Education, Washington, DC
 Potomac Job Corps Center, Washington, DC
 Department of Defense Education Activity, Washington, DC
 DC KIPP: Key Academy, Washington, DC
 Amidon-Bowen Elementary School, Washington, DC
 U.S. Senate, Health, Education, Labor, and Pensions (HELP) Committee, Washington, DC

Montgomery County Public Schools, Rockville, MD
 Montgomery Community College, Rockville, MD
 Maryland Higher Education Commission, Baltimore, MD
 Maryland Department of Education K-12, Baltimore, MD
 University of Maryland, College Park, MD

Northern Virginia Community College, Annandale, VA
 Mountain View Alternative High School, Centreville, VA
 George Mason University, Fairfax, VA
 Thomas Jefferson High School for Science and Technology, Alexandria, VA

Boston Latin School, Boston, MA
 Minuteman Regional High School, Boston, MA
 Massachusetts Institute of Technology, Boston, MA
 Northeastern University, Boston, MA
 Center for Education Policy Research at Harvard University, Boston, MA
 Somerville City Public Schools, Somerville, MA
 Massachusetts Department of Elementary and Secondary Education, Boston, MA
 Massachusetts Department of Higher Education, Boston, MA
 Houghton Mifflin Harcourt Inc., Boston, MA
 Virtual High School, Inc., Boston, MA
 Chelsea City Public Schools, Chelsea, MA
 HarvardX, Boston, MA

Field Studies – International

U.S. Consulate General, Shanghai, China

American Chamber of Commerce, Shanghai, China

Shanghai Education Commission, Shanghai, China

Shanghai Technical Institute of Electronics and Information, Shanghai, China

East China Normal University, Shanghai, China

New York University – Shanghai, Shanghai, China

Shanghai Library, Shanghai, China

Roundtable at Shanghai American Center with Chinese parents, Shanghai, China

INTRODUCTION

Education has historically given all Americans—rich and poor, black and white—opportunity. It has allowed individuals to achieve their dreams, and it has fueled the continued innovation, growth, prosperity, and security of this nation.¹

Education is a key component underpinning the national security of the United States (US). It drives the economy, sharpens the nation's competitive edge in science, technology, and innovation, develops the minds of people of all ages, raises the poor out of poverty, and is the great social equalizer. The US is a recognized global leader in education, and higher education is the fuel for prosperity and security.² As college costs rise, students are increasingly ill-prepared for postsecondary courses, and employers are less able to find qualified employees, some may ask whether the fuel is running out. As the nation and its new administration look to secure opportunities and economic prosperity for its populace, it is appropriate to assess the current higher education landscape, evaluate the market drivers, and look for ways to improve the possibilities for future generations. According to the Organization for Economic Cooperation and Development, the US spent \$11,700 per full-time equivalent (FTE) student in 2012, which was 31 percent higher than the average of other countries (Figure 1 of Appendix A).³ At the postsecondary level, the US spent 2.8 percent of Gross Domestic Product (GDP), which was higher than the average (1.5 percent) and higher than that of any other country.⁴ If one includes education spending across all levels (elementary, secondary, and postsecondary), spending grows to 6.4 percent of GDP⁵ as seen in Figure 2 of Appendix A.

Higher education provides opportunity by bringing students together in an environment that stimulates learning and enhances cognitive and non-cognitive factors that lead to improved livelihoods. At the same time, institutions of higher learning serve other constituents, including employers, faculty, governments, and others, with an interest in building and applying knowledge. As economic platforms, these institutions have numerous disconnects in the market to include information failures and misaligned incentives. Through effective **platforms**, enabled **people**, and improved **processes**, an increased national investment in higher education will address these market failures to increase opportunities, improve prosperity, and enhance national security. This paper examines the higher education industry in its current form, the market failures and corrective actions taken to date, and suggests changes that will improve the overall market condition. Lastly, the paper provides in-depth essays on the higher education shortfalls and proposed solutions.

THE INDUSTRY DEFINED

The definition of higher education includes any formal, post-secondary education. It is a diverse, specialized industry, which provides opportunity and serves the needs of a variety of constituents – from students and faculty to employers and citizenry. Students gain from the education they receive, faculty members benefit from employment and research opportunities, and colleges compete for both students and faculty. Employers gain access to a more educated and productive workforce. College towns gain from the economic spillover and the populace that universities tend to attract. Lastly, society gains by having a more educated citizenry. This dynamic results in informed voters, higher tax payers, increased innovation, and stronger leaders. Hence, the higher education industry is not simply in the business of providing a degree. Rather, it provides something that appeals more broadly.

Opportunities. The higher education industry provides increased opportunity manifested

in several areas. Each of the constituents named above receive some form of opportunity through the interactions this industry provides. For example, students value the education because it provides an opportunity for employment and ultimately a livelihood. Faculty members appreciate the opportunity to develop and share their knowledge with students and colleagues. Employers leverage the opportunity to partner with talented and innovative students who have the potential to become future employees. Because the value of its product depends on the interaction between and within the groups of the constituencies it serves, a traditional market approach cannot capture the dynamics of this industry.

The Platform. As depicted in Figure 3 of Appendix A, using a two-sided market or multi-sided platform approach is a more appropriate way to define the higher education industry. “The platform is a combination of software, services, transactions, and relationships, bundled into a seamless identity.”⁶ Success depends on the platform’s ability to attract participants on each side that appeal to the other and form a connection between the constituents. Some examples of platform providers include LinkedIn (connecting job seekers with employers), Apple (connecting mobile device users with app developers), American Express (connecting Cardholders with merchants), and Facebook (connecting users with each other, services, entertainment, and advertisers).

Higher education institutions are multi-sided platforms. Success is based on the ability to build coalitions that rely on each other to achieve their individual aims. For example, students are looking for learning opportunities that result in gainful employment. Professors want research opportunities, which require state of the art facilities, funding, and apprenticeships. Employers compete for access to the resulting talent. Governments are interested in the positive externalities associated with higher education. Ultimately, these higher education institutions are dependent on each other for individual success.

Competition. Institutions compete based on both quality and price. In this way, they could be categorized as monopolistic competition. The players in this market offer quality in the form of prestige. Much of their strategic behavior is about prestige, which allows them to attract higher caliber students and faculty and subsequently convey credentials that are valued by employers and contemporaries. Because the reputations of these institutions are valuable, alumni remain connected to the institution and provide resources, which sustains that prestige.⁷

Market Entry. Since success depends on generating interest from multiple parties, firms typically find it difficult to enter a two-sided market. In addition, new entrants may need to show that their educational programs meet established standards, which are backed by accrediting bodies. The challenges and opportunities facing the higher education industry should be viewed in the context of the multi-sided platform structure in which these institutions operate.

Constituencies. Among the number of parties involved in the higher education market, key constituent groups are students, faculties, employers, and governments as depicted in Figure 3 of Appendix A. Ancillaries include those that gain from the industry indirectly such as services companies (campus services, facilities management, private housing, restaurants and hotels) and educational support providers (learning management software, textbooks, bookstores, computer resellers). In addition, the US higher education industry attracts a large number of foreign students; the Los Angeles Times outlines “[a] record high of more than 1 million foreign students came to America for higher education [in 2015].”⁸ The large and diverse interested parties complicate efforts to reform higher education policy and practices.

CURRENT MARKET CONDITIONS

National security depends on economic prosperity, and this prosperity is based on having a productive workforce.⁹ The US educational system exists to build and sustain a highly productive workforce. The higher education industry supports this system by extending human capital gains in secondary education with additional gains from general and specialized education. The overall health of the US higher education industry is strong and the importance of the platform, people, and processes cannot be overstated.

The Importance of the Platform

Segmented. Because the needs of the US economy are diverse, the higher education industry is segmented – its institutions compete across multiple dimensions. First, they define themselves based on a broad offering of programs. Four-year colleges and universities, two-year colleges, and career and technical educational (CTE) schools, previously known as vocational, provide different opportunities and require different levels of investment. Second, within these categories, schools compete for high caliber students and faculty. Third, even within schools, some programs gain prominence over others by recruiting well-known faculty or funding expansive research projects.¹⁰ This is exemplified in higher education institution ratings,¹¹ which consider the quality of both the overall school and of specific fields of study. Finally, these institutions compete against schools in shared geographic regions. While a few have attained levels of national or global prestige, most institutions concentrate on competing in their region, state, or metropolitan area.¹²

Education-Skill Gap. The higher education industry is dominated by four-year public and private, degree-granting institutions. However, strategic leaders are calling for a focus on CTE.¹³ Because the industry employs a platform-centric model, these institutions are well established. As the government increased funding for college attendance through the Pell Grant and Post 9/11 GI Bill, new, for-profit entrants emerged to capitalize on students who now have access to capital to finance their education.¹⁴ These players leveraged internet-based learning environments to increase their enrollment. Recently, for-profit institutions have fallen out of favor. Students graduate from for-profit institutions at lower rates than those who matriculate at traditional platforms.¹⁵ Even among those who do graduate, job prospects are poor. Most of these graduates are having a difficult time finding jobs, which support educational loan repayment. This perpetuates the gap between what employers need and what skills employees have to do the job.¹⁶

Substitutability. To define the competitors within the industry, it is useful to consider their degree of substitutability. For example, someone who wishes to enroll as a student or join the faculty at Yale University may also consider an appointment at Harvard University. However, it is unlikely that this person would enroll or join a two-year college or CTE school. The higher the degree of substitutability, the more competition exists. Due to constraints on funding and the availability of publicly funded state schools, many students are unable to consider substitutes outside their state of residency.¹⁷ The higher education industry must be mindful of the opportunity costs that students face. Most students who pursue higher education, give up the opportunity to work.¹⁸

The Importance of People

Students. Within peer groups, institutions compete fiercely for high-caliber faculty and students. In a platform-based economy, it is essential to build constituencies that add benefit both within and across groups. This is why universities are selective in admitting students. For example, both the admissions departments at the Massachusetts Institute of Technology and the University of Maryland emphasized the care taken in shaping their student bodies.¹⁹ They compete for students with other universities in order to establish a diverse student body that

enhances their educational program. Beyond formal curriculum, student interaction is a major contributor to the formative experience. The institutions' efforts reflect awareness that they cannot neglect these network effects while building a complete picture of the university.

Faculty. Schools also benefit from a strong faculty. By enrolling a talented student-body, the school both requires and attracts a high-caliber faculty. Faculty benefits from their students' talents by applying for grants and external funding, which contribute to school revenue. For example, the University of North Carolina Public Health department expects its professors to fund their own salary and contribute to support staff resources by obtaining grants and research contracts.²⁰ Also, the Department of Defense (DoD) depends heavily on university affiliated research centers (UARCs) for basic research that support national security programs.²¹ By serving as a platform for faculty who wish to conduct advanced research, higher education institutions leverage talent in both classrooms and labs for the benefit of their students. In turn, students attend schools that offer opportunities to work with world-class faculty members.

Employers. Institutions of higher learning have also explored initiatives to build connections with employers. Elite schools build a portfolio of high-achieving students that it markets to employers. In 2016, 24 percent of Harvard University graduates accepted a position offered through its "Campus Interview Program."²² Some firms recruit exclusively from certain schools.²³ Northeastern University has a co-operative program that matches its students with corporate internships, with over 2,500 companies participating in this program.²⁴ Finally, trade schools often establish pathways that lead to employment in a particular industry. Because of the high cost of education, institutions know they must connect students with job opportunities that provide sufficient return on the students' educational investment.

The Importance of the Processes

Initiatives. In addition to improved personnel, sector competition is encouraging new initiatives such as online/hybrid learning, outcome-based focus, and guided pathways. Many institutions, such as Harvard University with the strategic initiative HarvardX, are exploring how massive online open courses (MOOCs) can enhance traditional learning and make their platforms appeal to audiences outside their traditional constituencies.²⁵ Some assumed MOOCs would become a substitute for brick-and-mortar education, but they have not yet threatened the traditional university system. Until employers begin to value the certifications which MOOCs confer, it is unlikely that students will substitute a traditionally obtained diploma with a MOOC certification.

Affordability. The cost of higher education continues to rise at a rate that outpaces inflation.²⁶ This is partly due to the increasing value employers place on higher education. But, there are also cost pressures from subsidies, i.e. grants and subsidized student loans, etc. As the government attempts to address issues with accessibility and affordability through the use of subsidies, the cost of education has risen.²⁷ Any modification to government policies designed to broaden availability should avoid distortionary effects and unintended consequences. Because of the positive externalities associated with higher education and a desire to ensure equitable opportunities for all citizens, the government provides financial aid. This aid comes in the form of direct payment to students, subsidized loans to students, grants to researchers, and subsidies to state-supported institutions. As federal and state budgets expand and contract due to underlying economic conditions, the value of subsidies fluctuates. Because higher education institutions raise revenue through student tuition, increasing tuition restores the dollars lost due from withdrawn subsidies.²⁸ For example, "[i]n total and after adjusting for inflation, funding for public two- and four-year colleges is nearly \$10 billion below what it was just prior to the recession."²⁹

Assessment of Value. Traditional methods to assess the economic health of an industry are

not available in this industry because most educational institutions are either private or public and do not provide standard financial filings. Because of the lifetime benefits that investments in higher education confer, it is unlikely that the industry is in jeopardy of collapse.³⁰ However, certain players in the industry are reliant on government funding. Recently, the government established the college scorecard, a tool to contrast the cost of an education with a typical salary.³¹ Because government funds subsidize education, the government has an interest in ensuring institutions minimize rent-seeking³² behavior and offer sufficient value. As a result of these efforts, several for-profit schools have closed due to lack of government support after their programs failed to confer sufficient employment opportunity to their graduates.³³

CHALLENGES TO OVERCOME

Although the market outlook for the US higher education system is strong, there are many challenges that affect the people, processes, and platforms that are the foundation for this industry. These challenges fall into two broad categories: information failures and misaligned incentives.

Information Failures Hurt People

An information failure occurs in the higher education market when individuals or firms have a lack of information for economic decisions that results in inefficient outcomes for either the students or other constituents.³⁴ Two such information failures are society's obsession with a four-year degree and student's failure to plan an academic course of study that leads to gainful, post-college employment.

The Four-Year Degree Obsession.

Together, we must achieve a new goal, that by 2020, the United States will once again lead the world in college completion. We must raise the expectations for our students, for our schools, and for ourselves—this must be a national priority. We must ensure that every student graduates from high school well prepared for college and a career.³⁵

Former President Barack Obama

Former President Obama's comments highlight the societal pressure to obtain a four-year college degree, however, his statement ignores whether the economy needs more traditional college graduates to improve the nation's economic prosperity and security. This pressure stigmatizes those who do not attend college. Not everyone has the desire, resources, or aptitude to graduate from college. Therefore, an overemphasis on a college education is contrary to national interests, specifically the need to train a sufficient base of skilled workers.

Failure to Plan. Even those who decide to attend a traditional institution often do not have an individual plan or purpose.³⁶ They mistakenly select academic courses of study without first determining the probable outcome of their choices -- particularly in terms of future employment. These uninformed choices have significant economic consequences. The average college student is burdened with \$36,000 in student loan debt; the US student loan debt now totals \$1.3 trillion.³⁷ In order to review the distribution of borrowers and the amount of outstanding debt from less than \$5,000 to greater than \$40,000, see Figure 4 of Appendix A. When a student terminates studies short of degree completion, this constitutes a self-imposed barrier to entry into the college-educated workforce. Failure to enter the workplace means unemployment or underemployment, which increase the likelihood of student loan default.

Misaligned Incentives Distort the Processes and Platforms

Misaligned incentives in a market occur when one party acts in its own interest rather than toward a common good or goal. In the higher education market, there are numerous instances of misaligned incentives. Two examples are the mismatched interest between secondary and higher education and the defective principal-agent relationship between the federal government and schools. This causes college unaffordability, which is exacerbated by a failed federal financial aid process.

Mismatched Interests. Although the education system is designed as a continuous and uninterrupted progression from pre-kindergarten through higher education, there is a schism between secondary and college competencies and standards (interests). A gap exists between what is academically required for high school graduation and what is the required baseline of academic competencies needed for freshmen year at college. Completion of a high school college preparatory program does not mean the student is actually prepared for college. This gap is evidenced by the more than 60 percent of students entering two-year schools and nearly 20 percent of those entering four-year universities who are placed in developmental classes.³⁸ Seventy-four percent of these remedial students do not obtain an associate's or bachelor's degree in five years.³⁹ The requirement for remediation courses comes at an increased cost and a loss of efficiency in the education process. The annual remediation price tag at two-year and four-year schools is estimated at \$2.3 to \$2.8 billion.^{40,41}

The cause of the misalignment between K-12 and higher education is the lack of consensus on the definition of college-level preparation.⁴² Due to the absence of common standards, high school institutions act in their own interests and measure success by graduation rates and compliance with state requirements. As remedial education requirements are often determined by specific higher institutional requirements, high schools do not take ownership of deficiencies perceived by those institutions. Instead, they declare victory when their internal tasks are completed and the students receive high school diplomas.

Principal-Agent Misalignment. Another misalignment in higher education involves agent bureaucracies acting in their own economic interests, contrary to the intent of the principal, the federal government. Although the federal government maintains it wants to "make completion of college a national priority," the number of people excluded from college due to unaffordability continues to rise.⁴³

In this way, the government has acted against its own stated interests. It has failed to make college affordability an economic reality and has excluded (through a financial aid process that it solely controls) a large segment of the potential student population who are "too poor to pay for college, but too rich for financial aid."⁴⁴ The determination of how much federal student financial aid a student is eligible to receive, if any, is determined by the data provided on the FAFSA (Free Application For Federal Student Aid) and results in an "Expected Family Contribution (EFC)," which is deducted from the overall cost. The EFC formula is fundamentally defective as it is based on the spending patterns of a low-income family in 1967, adjusted upward over 50 years based on the consumer price index.⁴⁵ It does not take into consideration family expenses, which includes existing debt load, need for saving for retirement, and saving for other children's college education.

Lastly, the government, as the principal, has failed to ensure that institutions, as the agents, use fair academic assessments during the enrollment process, leading to further misalignment among the constituents of the market. For example, in addition to precluding a large segment of the low-income population from attending college, the government failed to act to terminate or force revision of the current flawed standardized testing system. This has disproportionately

impacted the admission opportunities for ethnic minorities and lower-income families in America. Low-income students at underperforming schools are less likely to have taken the recommended core curriculum prior to taking either the SAT or ACT exam as 11th grade students. Additionally, as long as high-stakes standardized tests are used to determine admission to colleges and universities, expensive test preparation services will continue to be in high demand. Unfortunately, the SAT and ACT are as much a measure of a student's test taking ability as they are an assessment of learning. This misalignment, along with information failures, poses significant challenges to the health of the higher education industry.

INDUSTRY OUTLOOK

National security and higher education are inextricably linked. However, the short through long-term outlook of this linkage is mixed. This is due to the numerous trends and challenges, which positively and negatively affect the people, processes, and platforms in the education industry. Using current (today), short-term (1-5 years), and long-term (6-20 years) timelines for analysis, the US is positioned to maintain its preeminent status as the leader in global higher education, which supports both the national interests and security.

Current State

The US higher education industry both directly and indirectly supports national interests and security. Directly, the higher education system provides economic prosperity, human capital, and material resources. Indirectly, it provides a myriad of benefits, including (but not limited to) a global industrial base and an engaged citizenry. However, while the current higher education industry meets most national security resourcing requirements, there are challenges. As highlighted previously, distorted processes and platforms in the higher education market thwart the nation's ability to reach full surge and mobilization potential. For example, the higher education industry provides an ample supply of graduates; however, a gap exists between STEM-related graduates and the national security demand for them in a highly productive workforce.

As discussed above, information failures and misaligned incentives create hurdles before the market can reach its optimum productivity. The increasing costs of higher education coupled with continuous, inelastic demand for better education creates a dynamic where the processes will not function properly and the people, or consumers, on both ends of the platform (students and employers), will not reach full potential.

Future State

Since the first university opened in the US 380 years ago, the benefits of attaining a higher education degree still hold true today and will likely continue into the future. These benefits include increased career opportunities, an improved social-economic status, political and civic involvement, national production, and innovation. Tuition increases, alternative pathways, standardized testing, and an emphasis on STEM curriculum will all impact future higher education processes, people, and platforms.

Tuition. Over the short term from a people perspective, the higher education industry will continue to see increases in the cost of tuition. The price of college tuition and fees has risen by 63 percent over the decade.⁴⁶ Unfortunately, this is not expected to change.⁴⁷ Student loan debt has risen by six percent over the previous year.⁴⁸ Because the flow of state and federal tax dollars to institutions has decreased, there is no incentive for these same institutions to decrease the price of tuition. As such, the cost difference will continue to be passed on to students and remain the primary driver for ballooning student debt.

Alternative pathways. Over the long term, the higher education industry can expect to see a slight increase in alternative pathways to traditional programs. Although access to higher education is at an all-time high, the threat of student loan default as a result of not completing a degree is causing many students to reconsider the traditional route. Consequently, there is a growing trend of students seeking degrees via alternative pathways to save money and find a career. These pathways include enrollments in high school CTE, on-line non-degree certificate programs, and community college associates degrees with follow-ons to the workforce or a traditional university. As more prospective college students realize that a college degree is no guarantee for follow-on careers, a greater emphasis will be placed on these paths.

Standardized testing. For higher education institutions (platforms) to fulfill their role, they must accurately assess whether a student will improve the institution's student body. The current standardized tests are detrimental to this process. Additionally, with sustained emphasis on equal access to higher education in the US, public dissatisfaction with standardized testing for college entrance will likely result in changes to either the testing format or on a de-emphasis on these exams for admission. This analysis is based on the statistics from both the College Board and ACT Incorporated on performance inequalities across gender, race, and income that limit the ability for certain classes of individuals to attend college.^{49, 50}

STEM. Emphasis on STEM curriculum in higher education will increase over the long term as the global dependence on technology and knowledge-based economies continue to grow. Increasingly, national security is technologically based, and trends of shortages within the STEM career fields have caused multiple countries to emphasize enrollments in this area.^{51, 52} Additionally, STEM education is seen as the best direct entry into the workforce as there is a persistent shift from industrial and manufacturing based labor to technological based careers: the employee is now running or programming the machine versus physically doing the labor.

On-line courseware. This growing trend enables a faster, yet more indirect, methodology to present materials to students. Current post-secondary students' dependence on the Internet and social media requires universities and professors to modify their pedagogical approach to meet these evolving needs. The growth of students enrolled in on-line learning over the last ten years is indicative of a changing student demographic – that of a post high school graduate to an adult learner seeking part-time coursework.⁵³

Overall Industry Assessment

Despite its many trends and challenges, the US higher education industry will maintain its preeminent position in the global education marketplace for the foreseeable future. This fact is due in no small part to the quantity and quality of US higher education institutions. According to the US News and World Report's 2015 ranking of the top universities in the world, 181 of the top 750 universities call the US home.⁵⁴ China comes in a distant second with 57 universities.⁵⁵ In addition to the US's position as a leader of quality higher education, it ranks only second behind the more populous country of India in quantity of higher education institutions, with India containing 8,407 institutions and the US with 5,758.⁵⁶

However, the US higher education industry lacks the motivation to resolve these challenges because governmental regulations do not impact the institutions' bottom-lines. Hence, the institutions make minimal effort to reform these areas; however, this does not mean all institutions are not taking action to resolve some of them – like decreasing information failures and realigning incentives across the market. The higher education industry is not alone in its responsibility to provide an educated workforce supporting national security. The industry receives varied levels of support from both state and federal governments.

GOVERNMENT ROLES AND POLICY RECOMMENDATIONS

The relationships between the federal and state governmental policy, the higher education industry, and its institutions have evolved over time.⁵⁷ State and federal governments have multiple levers, which can be adjusted to impact the industry and play a significant role impacting people and processes. Financial levers include research grants, student loans, tax breaks and other financial incentives. Non-financial levers include executive actions, policies, and federal and state legislation. These levers create opportunities for millions of Americans to pursue higher education regardless of their socio-economic status.⁵⁸

Roles of the Federal and State Governments

Currently, the federal government plays a significant role in two areas of higher education - providing financial assistance for higher education programs and ensuring access for all. The Department of Education (DoE) develops education policy and regulations, to include post-secondary financial aid. Title IV of the 1965 Higher Education Act (HEA) authorized “student financial assistance programs—including federal grants, loans, and work study.”⁵⁹ These grants, loans, and work-study programs shaped the foundation of today’s federal higher education policy. The 2016 combined federal spending on higher education loans, grants, and tax breaks was \$134.2 billion. The 115th Congress has the task of reauthorizing the HEA and intends to address the “reality of today’s labor market and reality of today’s students.”⁶⁰ The executive branch impacts the higher education market through its agencies, rulemaking, and budget proposals to Congress. Additionally, when the DoE determines that a particular area is of “federal interest,” rules and mandates require institutions to provide data regarding graduation rates, athletics, crime, and other areas of interest.⁶¹ Many institutions find this reporting to be onerous; but at the same time view it as necessary in order to measure trends and focus on outcomes.

State governments have more of an impact on higher education through their influence on tuition, career or industry specific financial aid, and research funding. Public and private universities and colleges must meet the requirements applicable to their location. In 2014, over 13 million students attended public institutions,⁶² where the states control the budget, curriculum, and institutional governance,⁶³ creating the education environment of their institutions.⁶⁴ Most state agencies provide scholarships or grants for residents, augmenting federal financial aid.⁶⁵ States also promote specific careers and local industries through financial aid programs to ensure that future employees are in the pipeline to meet industry demand. For example, in Massachusetts, the state financial aid packages include a mix of grants, loans, scholarships and tuition waivers, promoting mathematics, nursing, or other state interests.⁶⁶ Finally, New York is offering an income based, free state college tuition scholarship for residents who agree to stay in the state for an equivalent number of years after graduation, although it is too early to assess the success of this program.⁶⁷ States target specific incentives to entice students to stay in state and to study areas needed in the state.

Recommendations

Invest in Counseling. Career counselors are needed across all levels of education. Career counseling should begin at the earliest opportunity in a student’s education experience and be applied consistently until workforce entry. This support is critical to stimulate a student’s interests in areas not previously considered, identify alternative pathways, help students choose major fields of study, and assist in workforce placement. Multiple studies and teacher testimonies agree that the right student to counselor ratio is ~250 to one, and not the 1,000 to one that many schools experience.⁶⁸ As discussed below, the roadblock to adding counselors is budget constraints, much to the detriment of the students.⁶⁹ The government should provide grants to fund dedicated

counselors or at a minimum, specific training to existing counselors to address information failures. Also, federal and state governments should incentivize secondary schools that have innovative counseling programs, broadcasting those successes to struggling schools.

The 2017 Every Student Succeeds Act (ESSA) authorized \$1.65 billion which included a flexible block grant program known as Student Support and Academic Enrichment Grants (SSAEG), that provided for student's college and career counseling.⁷⁰ The SSAEG does not fully address the need as it also supports mental health training, violence prevention, nutrition education, physical education, bullying and harassment prevention, music and the arts, STEM programs, educator professional development, blended learning projects, and more.⁷¹ Future legislation and budget proposals should specify target counselor ratio goals and specifically provide a stand-alone grant provision to address the counselor shortage directly. Further analysis would need to be completed in order to identify offsets to fund this initiative.

Alignment of K-12 to Higher Education. Linking the K-12 and higher education systems is needed to ensure students are prepared to perform at the postsecondary level. High school requirements with college content and competency expectations must be better aligned. Best practices should be published, shared, and replicated across the nation, eliminating local stovepipes

The federal government should lead efforts to explore common inter-institutional elements of pre-admission testing. Currently, 92 percent of higher education institutions use ACCUPLACER or COMPASS placement exams to assign students to developmental courses, but the exact cutoffs and test scores differ widely and these placement tests often have little correlation with students' future academic success.⁷² At the federal level, the DoE can study this misalignment and provide guidance to assist higher education institutions as well as secondary schools to identify essential student skills needed for college-readiness as there is a distinct difference between high school proficiency and college readiness. The absence of collective responsibility between the K-12 and higher education system increases cost, blindsides students, and restricts progress within the system. Targeting this alignment gap is best accomplished at the federal level. For instance, CTE has been a focus area for a number of years. Research shows these programs reduce dropout rates and encourage participation in post-secondary education.⁷³ Furthermore, CTE provides students with the ability to earn industry-endorsed certificates and college credit through dual enrollment. These pathways have the potential to engage more students, increase high school graduation rates, and provide post-secondary success.⁷⁴

Labor and Education Alignment. Alignment at the state and federal level among the Departments of Education and Labor will support national objectives in meeting workforce goals. States can provide near real-time and data-driven assessment of changes within the workforce structure needing to be addressed within their respective states. For example, Tennessee's Labor Education Alignment Program (LEAP) provides grant money to incentivize education and labor partnership alignment. "Local alignment groups will help develop skills gap forecasts, identify the highest priorities, develop programs or equipment needed to fill those gaps, and then submit applications for grants to help fund these programs."⁷⁵

A national level working group consisting (at a minimum) of the DoE, the Department of Labor, and the Department of Commerce should be formed to align higher educational to the work force and US economy. This working group will bring into alignment the state workforce education boards and other organizations like Tennessee's LEAP to provide national guidance to all states and assist in synchronizing efforts, identify and promulgate best practices, and shape education policy to address future work force needs.

Revamp the Financial Aid Process. The data provided on the FAFSA drives the student's eligibility for all federal financial aid: Pell grants, Federal Supplemental Educational Opportunity grants (FSEOG), Perkins loans, Stafford loans, PLUS loans, and Federal Work-Study jobs.⁷⁶ Because it does not address family expenses, existing debt load, saving for retirement and for other children's college education, a gap exists in college financing for the middle class. For example, Johns Hopkins University's tuition was \$54,470 in 2016. After financial aid, a middle-class family owes \$48,470 (nearly median household income in the US.⁷⁷ This student, under the FAFSA formula, is "too poor for college, too rich for financial aid."⁷⁸ Reforming the FAFSA and federal financial aid rules to include more household wealth indicators will make college more affordable for more people and will create more opportunity. The federal government should also remove the cap on student loan borrowing and restore the tax deduction for repayment of student loans, which was eliminated for middle class families earning \$160,000 or more per year. The resultant costs of these initiatives would need to be researched further.

ESSAYS ON THE MAJOR ISSUES AND RECOMMENDATIONS

As the nation struggles to ensure opportunity and economic prosperity are fostered through the people, processes, and platforms supporting higher education, stakeholders have a responsibility to examine those issues critical to the market. The essays that follow examine workforce gaps, employer sponsored education, and college-career imbalance to illuminate areas where the nation can enable people in the higher education industry. Additionally, to facilitate informed policy decisions, the essays recommend improvements in the processes and platforms, including a comprehensive assessment of standardized testing, remediation, and higher education affordability.

Enabling People in Higher Education

Linking Higher Education to the Workforce

United States colleges and universities are producing graduates incapable of meeting workforce needs due to a lack of information, lack of opportunity, and a misalignment of skills.⁷⁹ This is a major failure if the purpose of higher education is to provide opportunities for entry into the workforce, to increase the nation's production, and sustain workforce growth. If higher education is the means to employment as the end, then graduation from a four-year institution should provide the full spectrum of skills needed for direct entry into the workforce. However, there is a widening divide between the values placed on higher education by universities, the students paying for it, and the employer's need for a skilled workforce. There is no right answer to ensuring every student reaches the goal of workforce placement; however, the following recommendations can assist students bridge the divide.

Invest in Career Counseling

An increase in the quality and quantity of career counseling is needed at all levels of education. Counseling is critical towards stimulating a student's interests in areas not previously considered, identifying alternative pathways, helping them choose major fields of study, and assisting in workforce placement. In a Gallup-Purdue survey from 2010 to 2016, just over half of students visited a career counseling office at least once during their time in college, and the results of those visits vary in benefit across the spectrum.⁸⁰ Although university administrators agree that the quality of counselors and the counseling experience matter, only a third of student respondents believe their university prepared them for life beyond college or assisted them in finding a job.⁸¹

Consistent career counseling must begin early in a student's education experience. The first key point of intervention occurs in high school, with the decision between entry into CTE program versus continuing a track towards a two- or four-year university degree. A consistent

remark from educators and administrators alike is that everyone needs a career,⁸² but not everyone needs a college degree. Counselors are the ones who help de-stigmatize community college as a viable entry into the workforce and as a preparatory measure for entry into a traditional university.

Multiple studies and educator testimonies agree that the right student to counselor ratio is no more than 250 to 1, as opposed to the current 1,000 to 1 many schools experience.⁸³ However, the biggest roadblock is budget constraints. As such, schools are left to find creative solutions to fill the gaps, or worse yet, simply do without. Federal and state governments have a key role in influencing counselor numbers through funding by either incentivizing better ratios, increasing counselor training, or by directly funding positions in public schools.

Increase Workforce-Education Cooperatives (CO-OPs)

Educators within most traditional universities see workforce-education CO-OPs, in which students engage in full-time paid internships in lieu of class attendance, as the antithesis to providing a broader education focused more on thinking than doing. Employers, however, require hard-technical skills and practical experience, as well as soft skills such as problem solving, communication, teamwork, and leadership, for entry-level employees to be successful. Practical work experience, combined with a higher education degree, provides an excellent opportunity to meet the needs of employers of the high-skilled workforce.

A highly successful example is Massachusetts' Northeastern University, which provides an ideal CO-OP opportunity for its students. Northeastern measures success as job placement and is meeting this goal with a 95 percent workplace placement of graduates.⁸⁴ Students are expected to attend the school for five to six years, complete coursework, and participate in six to 18 months of apprenticeships with one or more of 250 CO-OP participating employers.⁸⁵ The school believes that work and education should never be separated and provides practical experience alongside their education. Ultimately, a network-centric approach is applied as the employer becomes part of the feedback loop to the school and part of the teaching team in the education experience. As an added benefit, Northeastern's student loan default rate is only 2.8 percent, well below the national average of 11.3%.⁸⁶ Other states should research successful work-education CO-OP models and develop one to fit their own needs and the needs of employers in their state.

Labor & Education Alignment

The failure of universities to adapt to the projected needs of the workforce require a skill-based re-alignment between university offerings and the career fields needed within the U.S. University supply does not meet employer demand. For example, universities are consistently overbooked in technology-based courses, yet employers still endure large droughts of qualified applicants in their technology based career fields. Specifically, the Massachusetts Department of Higher Education predicts a degree shortage over the next 8 years of at least 55,000 to 65,000 needed to sustain the growth in the STEM career fields.⁸⁷ For some universities in Massachusetts, "there are 17 jobs for every one graduate with a degree in computer science or information technology."⁸⁸ This problem is not unique to Massachusetts; it is a national problem for states trying to fill STEM career fields.

Alignment at the state and federal level among the Departments of Education and Labor would help support national objectives in meeting workforce goals. States, as opposed to the federal government, can provide near real-time and data-driven assessment of changes within state workforce structures. Tennessee is taking this precise course of action with their Labor Education Alignment Program (LEAP), which provides grant money to incentivize education and labor partnership alignment. "Local alignment groups will help develop skills gap forecasts, identify the highest priorities, develop programs or equipment needed to fill those gaps, and then submit

applications for grants to help fund these programs.”⁸⁹ With multiple state inputs, the federal government can accomplish the same between education and labor departments at a higher level.

Employer Sponsored Education

The benefits of education accrue to both individuals and their employers. However, investments in human capital are tied to people. Human capital theory suggests that individuals will invest in general, transferable human capital; and without a mechanism to restrict leaving, employers will limit their investment to firm-specific skills. Yet, in contrast with this theory, more employers are funding advanced training opportunities for their employees to acquire academic degrees that are broadly transferable.

There are several plausible explanations. First, assistance with tuition may reduce employee turnover. Second, companies are competing for talent. High ability workers tend to also be life-long learners; so, by offering opportunities for additional education as a form of compensation, employers may attract employees with higher ability. Finally, employers may be able to pay lower wages to those who initially enter the company with less general human capital. The firm then provides general education in conjunction with on-the-job training. No matter the underlying reason, companies are choosing whether to either hire those who are educated or provide new employees funding for higher education — *hire education* or higher education.

The military faces a similar choice. The DoD invests a considerable portion of its budget on education and training.⁹⁰ In 2015, the services spent over \$10 billion on recruiting and initial training. This figure does not include advanced and ongoing training such as the \$1.5 billion the Air Force spent that year on additional training to further develop its pilot workforce.⁹¹ Also, the military operates three undergraduate service academies, nine graduate schools, a medical school, and hundreds of officer training detachments that serve nearly every major university campus. These programs require significant funding. For example, the department spent over \$750 million on education and training for the Defense Health Program, \$135 million to operate the Defense Acquisition University, and almost \$80 million for the education provided at the National Defense University.⁹² In addition, for officers, enlisted, and civilian personnel, the military delivers professional military education and ongoing occupational training throughout each member’s career. The military must find better ways to manage its education and training portfolio to maximize its return on human capital investments. This effort demands a clearer understanding of human capital theory and its impact on the workforce.

Unlike civilian employers, the military can bind its employees through enlistment and service commitments. Furthermore, many have an affinity for military service that leads them to serve out of intrinsic desire. Despite these advantages, the military must reform its human capital development processes to capitalize on scarce resources. To fully capitalize on investments in education and training, the DoD should do the following:

- *Preserve cultural norms.* Overreliance on market norms, such as binding contracts or monetary incentives will diminish intrinsic motivations to serve. The military should exercise caution in relying on service commitments — even in exchange for educational benefits. Otherwise, members may consider their service as a transactional relationship.
- *Leverage the Tuition Assistance (TA) program for military purposes.* The Defense Department should update its Voluntary Education programs to encourage members to pursue degrees that increase military productivity.⁹³ Some may argue that by focusing TA on specific training rather than general training, the services would deprive members of an earned benefit; however, the impact of this argument is overcome by the post-9/11 GI Bill which funds general training after completion of military service.

- *Consider whether commitments are commensurate with investment costs.* Officers who participate in the TA program must remain on active duty for two years after completing TA funded education or training. Whereas, enlisted members do not incur an additional service commitment. The Department should analyze whether TA and other investments in general training have an impact on workforce quality and retention. If the department cannot show that the programs enhance the quality of recruits, reduce turnover, or lower the need for cash compensation, they should consider changing or eliminating some of these benefits.

Employers have a choice in how they acquire human capital. They can hire workers who already have education that increases their productivity, or they can supply higher education to employees to boost their productivity. Hire or Higher — or some combination of the two — allows companies to employ workers with the know-how that ultimately yields an advantage in competitive markets. By offering educational benefits, firms can attract and retain higher ability workers whose productive capacity exceeds their basic wages.

The military has a proclivity to hire first and then invest in education and training to build productivity. This is an expensive model. As employees develop general knowledge and skills, they become more desirable in the labor market. Many choose to leave military service for civilian employment opportunities. Firms who hire fully trained workers have lower costs than other firms. Currently, it is unclear whether the military's human capital strategy is efficient.

College and Career Ready Imbalance

The United States must rebalance the educational focus between Career and College Ready through a concerted effort to *reemphasize* quality alternate post-secondary pathways when compared to traditional college, a national drive to *destigmatize* vocational/technical training educational/career path (as a perceived inferior path), and an understanding that the nation must *revitalize* career and guidance counseling all levels to truly incorporate the holistic view of student development.

An underserved, 2nd Class Pathway

With the nation's intense focus on college readiness, the education system fails to equip the nation's youth to join the work force. Only a healthy and vigorous career and CTE program can provide that preparation. However, there is an overpowering stigma that CTE is the second-class educational pathway for American students both in high school and beyond. The 1963 Vocational Education Act split academics from vocational education for funding purposes.⁹⁴ Once separated, local budget constraints stripped vocational training opportunities out of traditional high schools. Recent efforts to maximize resources to support STEM further this trend. As a result, most CTE programs were moved to specialty vocational centers that could support larger regional areas. These centers are limited to the population hubs that could support the demand, which meant very scant opportunities in rural areas.

More importantly, the nation is currently facing a critical skills gap in the workforce that is expected to continue unless we reestablish CTE as a viable alternative to college. The demand for skilled labor, especially during the recent economic recovery and current slow growth period, highlight the benefits of career ready certifications at the postsecondary level and have started to shift public opinion on career ready education programs. Despite new job growth, current unemployment suggests that there are approximately eight million people looking for work who do not possess the skills necessary to fill American employers' needs.⁹⁵ This will only get worse until society begins to emphasize career ready-pathways earlier in students' educational timelines. The Center on Education and the Workforce at Georgetown University predicted the US will create

47 million jobs between 2008 and 2018.⁹⁶ Roughly two-thirds of those (32 million) will require an education beyond high school . . . but what kind? A full 50% of them will require an associate’s degree or occupational training, yet vocational training has not been a priority. In order to meet the need for reform, this essay asserts the following recommendations for consideration.

Re-emphasize Quality Alternate Secondary Education Pathways; Ensure no Dead-Ends

It is imperative the nation must create and promote alternate pathways towards a career if stakeholders are to break the stereotype that college is necessary for everyone. These pathways must encourage individual growth based on the aptitudes and interests of each student. They should also be flexible and linked to each other so students maintain the ability to transition between programs without having to start completely over, i.e., no dead ends.

- *College Preparatory Pathway.* Students identified with the aptitude and desire to attend college should take the pre-requisite courses to gain admission to traditional 4-year universities. Accelerated learning and Advanced Placement (AP) courses will assist in preparing these students for college success.⁹⁷
- *Blended Academic/Career & Technical Pathway.* Ensure a focus remains on academic requirements for high school graduation, as well as basic college admittance (leveraging available AP courses) while obtaining essential qualifications in order to gain valuable work experience. This program could seamlessly extend beyond high school to obtain necessary credits for qualification in a selected career field or the student could still pursue enrollment at a traditional 4-year university.
- *Dedicated Career & Technical Educational Training Pathway.* This focus would be on meeting basic high school academic requirements while providing full access to CTE training. This pathway could be offered at a full-time vocational institution or as part of traditional public secondary school. Limited opportunities currently exist around the country. However, the Somerville High School in Massachusetts is an example of a school system that is providing this pathway. They have an extremely robust, yet undersubscribed CTE program, with 14 different offerings ranging from advanced manufacturing to culinary arts and cosmetology.⁹⁸

De-stigmatize Career/Technical Training Pathway as Inferior Life Choice

This must be a national level campaign to change the culture of American education. However, we must emphasize this is a national initiative executed by the states to ensure CTE training is tied to the local economy and job markets, and really focuses on education for a career not denigration. We recommend this turn into a joint venture between the Departments of Education and Labor to provide early input into market based curriculum and CO-OP arrangements – similar to the Job Corps (a Department of Labor initiative). As part of this education process, this initiative needs to highlight jobs that can lead to successful careers with specialized training but without the traditional college diploma. Especially worth noting is that some of these pay better than many jobs requiring bachelor’s degree, specifically “27% of people with post-secondary licenses/certificates . . . (will) earn more than the average bachelor’s degree recipient.”⁹⁹ This will de-stigmatize CTE without deemphasizing college as a viable alternative for those who want to attend. The end game is to level the playing field or balance the scales.

Revitalize Career & Guidance Counseling Programs at all levels

As previously discussed but restated for emphasis, an essential element for each pathway is the need to expand and revitalize the school counseling career field. To truly benefit students, well-trained college and career counseling teams must be established that are capable of shaping and guiding every student individually.

To improve the system, the nation must take significant action to rebalance the scales of college and career ready. To accomplish this, the nation must *re-emphasize* quality alternate post-secondary pathways besides traditional college, a national drive to *de-stigmatize* vocational/technical training as an inferior educational/career path, and *revitalize* career & guidance counseling at all levels to truly incorporate the holistic view of student development.

Improving the Processes and Platforms

Standardized Testing

The average pre-K through 12th grade student in the US will take 112 tests and eight standardized tests each year.¹⁰⁰ These certainly vary from state to state and district to district. However, two standardized tests are universal and in many cases, are not optional for those who wish to attend college. These are the SAT and the ACT. Because these two tests have become the mandatory gateway to college, any inequity in testing which places barriers to admission creates inequalities across generations. *Statistics prove the SAT and ACT do in fact reinforce ethnicity, gender, and income inequalities which results in a large scoring divide between subgroups.*^{101 102} *Furthermore, these inequalities are furthered by under-performing schools, which do not administer core curriculum, the unaffordability of test preparation services, and test questions, which are unfair or biased.*¹⁰³

History. The SAT and ACT were originally acronyms which stood for the Scholastic Aptitude Test and later the Scholastic Assessment Test as well as the American College Test. These names have been officially dropped from use and have been branded solely as the SAT and ACT. Some 20 states are aligned with the ACT and 18 states including Washington, D.C. are contracted with the College Board to administer the SAT. In 2015, the ACT surpassed the SAT as a record number of high school graduates (59%) took the ACT as compared to the SAT.¹⁰⁴ In 2015, 1.9M students took the ACT and 1.7M students took the SAT. Of the 3.6M students who took the SAT and ACT nationwide in 2015, conservative estimates place the cost at \$27M.¹⁰⁵

Statistics. As 2016 testing year statistics are not yet available, this essay utilized SAT and ACT's 2015 gender, ethnicity, and income statistics (among others) from both the College Board and ACT Incorporated websites. A compilation of the data from 2015 was compiled and the results are clear. If a Caucasian or Asian male has advanced degreed parents make >\$100,000 per year, he will score well above average on the SAT and just above average on the ACT; everyone else will score lower and in many cases, much lower (Table 1 and 2 of Appendix B).¹⁰⁶

Income. There is a direct correlation between low family income and low SAT scores in all categories – critical reading, mathematics, and writing. Although specific data which compares ACT scores and income demographics is not publicly available, ACT Incorporated data on “benchmarks for college readiness” showed 62% of students from families with an income of >\$100K per year will obtain a B-C grade or higher in three or more college courses (English composition, college algebra, reading, biology, and social studies).¹⁰⁷

Ethnicity. African Americans continue to underperform both Caucasians and Asians by a large margin. This is known as the “Black-White Gap” in testing circles. The disparity of SAT scores in reading and math has persisted for the past 29 years and in writing for the past nine years.¹⁰⁸ The results are identical for the ACT; African Americans have consistently underperformed all other ethnicities in English, math, reading, and science since 1998.¹⁰⁹

Gender. Gender statistics are tracked similarly by both tests and date back to 1967. The results? Statistically speaking, a male taking either the ACT or SAT, will outscore females in math and science. A female taking either the ACT or SAT will outscore males in English, social studies, and reading.

Causal Factors. There are three main causal factors that reinforce inequality in testing – underperforming schools, which lack the core curriculum; expensive test preparation services, which have become necessary to score well; and test bias, which results in a lack of fairness.

Lack of Core Curriculum. Low-income students at underperforming schools are less likely to have taken the recommended core curriculum prior to taking either the SAT or ACT exam as 11th grade students. This core curriculum consists of four years of English (starting in 8th grade) and three years each of Science, Math, and Social Studies. As a correlation, wealth inequality by ethnicity has grown since the Great Recession. According to the Pew Research Center, the wealth of Caucasian households in 2013 was 13 times the median wealth of African American households, compared to eight times the wealth in 2010.¹¹⁰ Meaning that a lack of core curriculum is not only true for low-income students, but for African American students as well.

Test Preparation Services. If high-stakes standardized tests are being used to determine admission to colleges and universities, test preparation services will continue to be in high demand. Unfortunately, the SAT and ACT are as much a measure of a student’s test taking ability as they are an assessment of learning. As such, in addition to reviewing subject material and administering practice tests, these services teach SAT and ACT test-taking skills and strategies. Parents can spend from as little as \$25 for a test prep book up to \$1,000 for a classroom course. These exorbitant costs (and the need to use them) are another example of how the business of standardized testing is furthering ethnic bias and income inequality. Unfortunately, the students who would benefit the most from test prep services are also the ones who simply cannot afford it.¹¹¹

Testing Fairness. Because of the high-stakes nature of the SAT and ACT, test validity and/or bias against any subgroup can have grave and long-term consequences. There are numerous examples (as recent as the Spring 2016 testing cycle) of test questions that were based on culturally and/or gender biased verbiage and stereotyped content.¹¹²

In conclusion, the SAT and ACT do in fact reinforce ethnicity, gender, and income inequalities which result in a large scoring divide between subgroups. This is due to underperforming schools and biased standardized tests, which are so nuanced that expensive test preparation services become practically mandatory. This results in large scoring divides across all subgroups (true since the late 1960s). With the move to eliminate the SAT and ACT gaining momentum, colleges and universities should move to make these tests optional and place more emphasis on high school grade point average instead. James Madison University is the latest to make this move.¹¹³ In the meantime, both tests should be rewritten to remove all bias and test prep services should be made available to all demographics. These steps will help to ensure higher education is for the best and brightest students . . . no matter their zip code, no matter their color, and no matter their gender.

Remediation

Developmental courses target students from underprepared recent high school graduates to immigrants and workers displaced by structural shifts in the labor market. Remediation has been part of higher education since the 17th century, where tutors in Greek and Latin served underprepared students.^{114, 115} Today, more than 60 percent of students entering two-year schools and nearly 20 percent of those entering four-year universities are placed in developmental classes.¹¹⁶ Of graver concern, 74 percent of those remedial students do not obtain an associate’s or bachelor’s degree in five years (Table 3 of Appendix B).¹¹⁷ Surprisingly, corrective impacts on student outcomes is mixed, implying that undergraduates in need of development do no better (and sometimes worse) than similar students who are not referred to remediation.¹¹⁸

While there are several plausible explanations for why many students arrive unprepared to complete college-level work, the root cause rests in the *misalignment between K-12 and higher education*. As the transition between high school and college continues to come apart at the seams, the U.S. K-12 system and the expectations of colleges and universities are askew.¹¹⁹ Whether it is the fault of a “wasted” senior year, detached state performance standards from higher education officials, or the current accountability focus on basic competency on high school exit exams, the annual remediation price tag is estimated at \$2.3 to \$2.8 billion at two-year and four-year schools combined (Table 4 of Appendix B).^{120, 121} Differing views on what necessitates placing a student in a developmental course feeds a *lack of consensus on the definition of college-level preparation*, creating inefficiencies and increasing cost.

State administrators must begin to re-think the ways in which they design, develop and deliver remedial education. Efforts should be stratified into strategies that target students prior to college application (identifying the correct number of needy students to lower cost), programs that combine basic skills attainment embedded with college-level coursework (creating efficient classroom learning environments), and supplemental resources to complement tutors and advisors (fostering developmental persistence). Only a systematic design comprised of a set of interrelated strategies to **Align, Standardize, Personalize, and Innovate** (“ASPI”) will succeed.

Aligning the K-12 and higher education systems represents the most critical step in establishing a “system of systems” process overhaul where leadership from high schools, colleges, universities and industry engage in a productive dialogue. High school requirements with college content and competency expectations must be better linked while best practices should be published, shared and replicated across the nation, replacing local stovepipes with a unity of effort. An understanding of how faculty, including adjuncts, is utilized is as important as teacher preparation and professional development; however, even the best instruction cannot achieve desired effects until the “intersection of the future” (link between K-12 and higher education) is aligned for successful travel.^{122, 123}

Although national *standardization* is improbable, high schools, colleges and universities must explore common inter-institutional elements of pre-admission testing such as **Timing, Test content and the Developmental Demarcation line** (“**T2D2**”). Multiple arbitrary interpretations of a single exam score for college placement fail to accurately classify and stratify the target population needing remediation. Because college placement tests have little correlation to students’ future academic success, fiscal and human capital cost burden are exacerbated.¹²⁴ Administering computer-adaptive college placement exams in grades 11 and 12 identifies students and allows them to address their academic shortcomings before arriving at college. However, standardized test mechanisms represent a fraction of the equation and do not capture other available factors like high school grade point average and counselor evaluations in completing the assessment picture.¹²⁵ While remediation is both a K-12 and a higher education problem, colleges must collectively articulate essential student skills for college-readiness, as there is a distinct difference “between high school proficiency and college readiness.”¹²⁶

Semester long lecture/seminar courses that demand student completion of remedial courses in serial fashion are ineffective and need complementary approaches like self-directed learning labs, *personalized* online-learning models, and the use of high-tech classrooms.¹²⁷ By eliminating its developmental math and reading courses and creating a co-requisite model of college-level courses linked to additional tutoring workshops, Austin Peay University raised the overall pass rate for math from 12 percent to 63 percent and the total pass rate for writing from 30 percent to 66 percent (Table 5 of Appendix B).^{128 129} Integrated developmental students advance their skills

by working closely with a smaller instructional team and these more personalized settings are as important as the content and delivery itself.¹³⁰

Third-party supplemental products are flooding the landscape of the education industry because tutoring and advising programs are delivering only small positive short-term impacts and few lasting long-term outcomes. Self-study options that use customized courseware, low-cost refresher sessions and tailored instruction represent *innovative* and *comprehensive* solutions encompassing more than just skills development. Implementation of modularized curricula through complementary computer-based programs enhances a personalized plan by providing 24/7 learning support for students with schedule restrictions.¹³¹ While content and delivery are key, recruitment of teachers with specialized training in research based developmental programs utilizing cutting edge technology is most critical to the teaching-learning process. Instead of “pulling out” students from a structural setting, remedial teachers and innovative technology must be “pushed into” classrooms and dorm rooms to provide support to students. Public and private partnerships could enhance both the product and the process, but consensus on private sector participation requires a properly scoped problem statement derived *AFTER* Alignment and Standardization is successfully accomplished. With advisor to student ratio growing, marrying specialized teachers with innovative products will best impact the remedial process.

The research suggests that remedial courses appear to both help and/or hinder students differently by state, institution, background, and level of academic preparedness. While useful, common core high school standards will not eradicate the need for remediation because students enter higher education from a variety of circumstances. Achieving a newly defined success requires changes beyond the individual classroom and needs to be framed using the “ASPI” method complemented with a vision, supporting strategies and innovative solutions from all stakeholders in the process. Before policymakers can better design and implement effective remediation programs more broadly, additional emphasis must be directed to identify sub-groups of students for whom remedial programs appear to be helping or hindering and to refine the remedial placement process using the “T2D2” method. The current absence of collective responsibility between the K-12 and higher education system increases cost, blindsides students and significantly restricts progress within the system.

Denial of Opportunity

The American middle class is being priced out of the opportunity of a four-year college education. As a result, they are being priced out of the opportunity to be better-educated citizens, to participate intelligently in politics at any level, and to earn meaningful levels of income for themselves and their families. The country loses the increase in productivity that would come from their increased level of education, and this loss has a resulting negative effect on the potential GDP. Lost GDP adversely affects the budget and national security.

There are a number of contributing factors to this economic crowding out phenomenon, and its effects are worsening by the day. This includes over-involvement by the federal government in lending, under involvement by the federal government in helpful legislation and resourcing, a lack of state resourcing to higher education, and a lack of incentive of any kind for the four-year colleges and universities to control their costs.

Rising Prices vs. Rising Costs?

Between 1978 and 2012, the price of college tuition skyrocketed 1,225 percent, compared with a 634 percent rise in medical costs and a 279 percent increase in the consumer price index.¹³² The exponential increase in price is tragic when viewed in historical context. Economist Richard Vedder¹³³ has estimated that:

Between 1939 and 1978, college tuition rose by an average of 1 percentage point above the inflation rate. In the nearly four decades since then — a period marked by a large infusion of federal tuition aid — the increase has averaged about 3.5 percentage points. Had the pace of tuition increases remained at levels seen during the earlier generations, college costs today would be about 60 percent lower.¹³⁴

Dr. Vedder maintains that the outstanding \$1.3 trillion in student loans has bankrolled lavish spending by colleges on new facilities to attract new students and satisfy alumni:

It gives every incentive and every opportunity for colleges to raise their fees. Many colleges are using federal largess to finance Hilton-like dorms and Club Med amenities. Stanford offers more classes in yoga than Shakespeare. Universities are in the housing business, the entertainment business; they're in the lodging business; they're in the food business.¹³⁵

At the present, there is no incentive for the colleges to control their costs. They will pass on the increased costs to the students and their families, who will have to go deeper in debt to pay those costs or run the risk of not attending college at all.

No financing available - the broken determination of need

The federal government has made itself the principal lender of college loans and controls the federal financial aid process upon which colleges and universities distribute financial aid. It has mismanaged both processes.

Except in cases where an institution elects to be more generous with its own funds, the determination of how much federal student financial aid a student is eligible to receive, if any, is determined by the data provided on the FAFSA, a document desperately in need of revision. The FAFSA data is used to calculate an EFC, which is deducted from the overall cost of attendance. The impact of the FAFSA is not limited to federal aid eligibility: state governments use the FAFSA EFC to calculate state-funded grants and scholarships; many individual schools use it to determine who will receive institutional grants, scholarships and loans.¹³⁶

The FAFSA might measure many things, but financial need for college is not one of them. The formulas are complex and the form is draconian. It does not take into consideration family expenses, existing debt load, saving for retirement, and saving for other children's college education. While the form makes allowances for other children currently enrolled in college, it forgives not a penny if the parents are saving for five more children who are not yet old enough to attend college or have a family member undergoing expensive medical treatment.¹³⁷ Under that formula, students are excluded who are "too poor for college, too rich for financial aid."¹³⁸

Affordability Policy Recommendations

The federal government should reform Medicare and Medicaid to free up billions of dollars in mandatory spending which could then be reprogrammed for education and passed down to the states. It should create opportunity, rather than destroy it, by reforming the FAFSA process and federal financial aid rules to make college more affordable for more people. It should also remove the cap on student loan borrowing and shift more of the loan burden to the students rather than the parents. It should also restore the tax deduction for repayment of student loans, which was eliminated for middle class families earning \$160,000 per year, regardless of the amount or number of student loans being repaid.

The states should contribute more money to education, especially public university infrastructure and technology, and create innovative fiscal solutions such as capping tuition raises for state schools and selling bonds to finance student loans with higher maximum amounts and lower interest rates.¹³⁹ It is a net gain for the state budget since “workers with higher incomes contribute more through taxes over the course of their lifetimes.”¹⁴⁰

Is China a Real Educational Threat or a Paper Tiger?¹⁴¹

“With over 1.36 billion people, the People’s Republic of China is the world’s most populous country and has the world’s largest education system.”¹⁴² China has a reputation for producing high performers and successful students, largely because “China has a long tradition of placing a high value on education.”¹⁴³ But is there a chink in China’s educational armor? China suffers from many of the same problems in their educational system as the United States. Policymakers in the United States would benefit from examining China’s current educational crisis and applying valuable lessons learned to the U.S. educational systems.

Background on China’s Education System

China’s robust education system has a similar construct as the United States, however students’ progress to the next level depends on their successful testing results. After secondary school, one must take the “high school graduation examination (Huikao)” and the “National college entrance examination (Gaokao).”¹⁴⁴ If a student earns a good score on the Gaokao, then either a four-year university or two to three-year college is in his future.¹⁴⁵ However, a low score often means no advanced degree, poor job prospects, and a loss of familial honor. In spite of this, educators across the world deem China’s education system as one to venerate and emulate in their own countries. China’s students receive international attention for historically producing high scoring results on the Programme for International Student Achievement (PISA) test, a globally accepted assessment for intellect.¹⁴⁶

Current Challenges to China’s Educational System

Although China is often lauded as a global education leader, the statistics indicate there is a vast disparity between rural and urban students. PISA scores are misleading since China’s scores represent only four urban regions of a very diverse country – only capturing the scores for Beijing, Shanghai, Jiangsu, and Guangdong.¹⁴⁷ For example, Shanghai is only 1.7 percent of China’s population. “[A]bout 84 percent of Shanghai high school graduates go to college, compared to 24 percent nationally. . . And Shanghai’s parents invest heavily in their children’s education outside of school.”¹⁴⁸ Rural students outside these large urban cities are more likely not to graduate from high school.

The sizable migrant population from rural to urban areas magnifies the discrepancy in education levels between students. “China’s remarkable economic boom over the past two decades has resulted in one of the largest mass migrations of people from rural to urban areas in human history.”¹⁴⁹ It is estimated that “Shanghai’s population comprises 11 million migrants and 13 million natives to the city.”¹⁵⁰ Migrant children, who move with their parents to the cities, are faced with urban policies, which make it difficult to benefit from state of the art schools available to urban families. “The internal passport system of Hukou limits access to urban schools for these kids. Without urban registration, parents often hire private tutors and create makeshift private schools.”¹⁵¹ China’s education system, which was once viewed as a class equalizer, now perpetuates socio-economic inequality.

As China’s economy booms, one might credit the educational system in providing a productive and innovative work force. The reality is much different – China is rarely ground zero for new innovation, which is possibly due to its education system. Dr. Yong Zhao, a

Chinese student-turned educator, examined the lack of creativity in the Chinese education system in his book, “Who’s Afraid of the Big Bad Dragon?” and he determined that “like the Chinese government itself, it does not produce a citizenry of diverse, creative, and innovative talent.”¹⁵²

Without successful reforms, China’s education crisis will have implications for the Chinese economy and national security. With a lack of internally generated innovation, China is dependent on buying or stealing other countries’ innovative technological advances. “Didactic teaching and regimented exams have failed to produce young people who foster technological innovation.”¹⁵³ In addition, potentially innovative students often leave China for higher education. “A rising share of top scorers dodge what are often arcane Chinese colleges and head overseas, especially offspring of the growing nouveau riche.”¹⁵⁴ Lastly, China must analyze the impact on its security as those entering the job market often are lacking the skills or not matching the demands of the economy to create a productive workforce. China has tried to address the disconnect, but with minimal effect; “[w]hile China has aggressively stepped up its spending on research, this isn’t translating sufficiently into innovation,” as reported by the OECD in March 2015.¹⁵⁵ Even with a significant increase in research expenditures, there has not been a corresponding uptick in international patenting and trademark registration.¹⁵⁶

Although an authoritarian government like China’s has many socio-economic disadvantages, one advantage for [China’s education decision makers](#) is that those involved in shaping the educational vision for the country have two tools – power to implement changes and time to develop a long vision. If the educational policymakers at the local, state, and federal levels have the authority to [remain in place during transfer of power](#), then the U.S. may have some success in implementing visions like China. China excels at mastering content and providing rewards for performance; however, new dynamics threaten that paradigm – rural and urban disparity reinforced by standardized testing, migration, education mismatch, and innovation gaps. The United States can [learn](#) from the successes and failures of the US’s Asian partner as both countries debate the core aims of education.

CONCLUSION

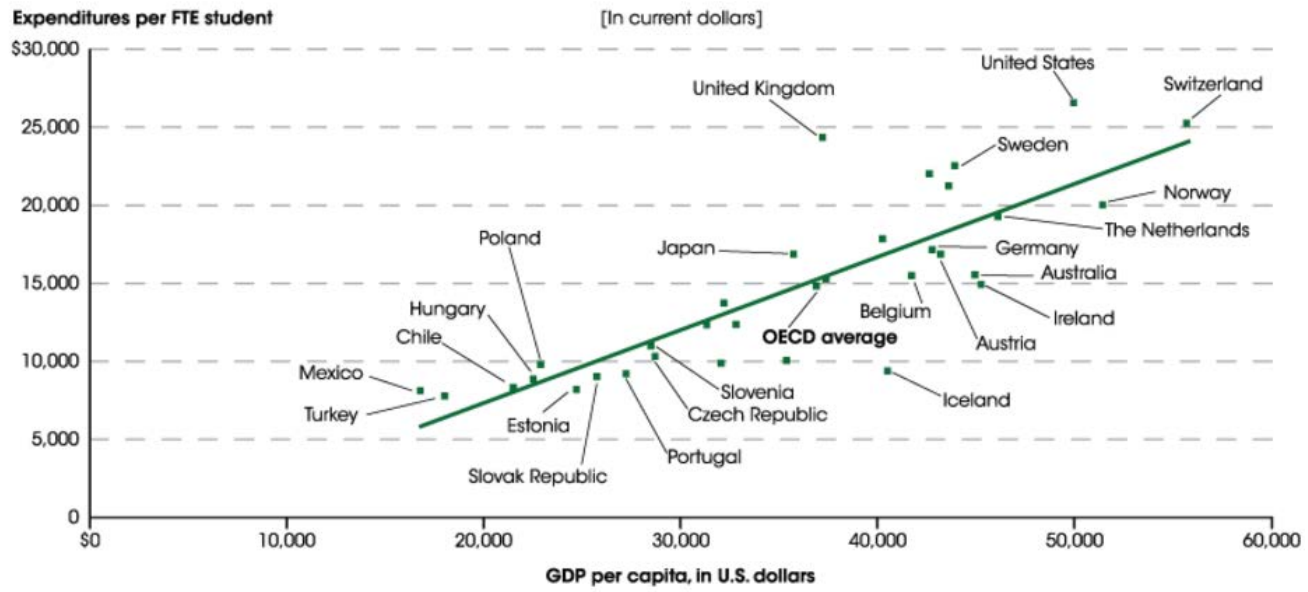
According to Condoleezza Rice, “[t]he state of education in our country is a challenge to our national security. Human capital has never been more important for success in our increasingly competitive world economy.”¹⁵⁷ Higher education is the fuel for US economic prosperity in a knowledge-based global economy, and burns most brightly when platforms, people, and processes are aligned to achieve the nation’s goals. The challenges caused by information failures and misaligned incentives distort the productivity of the market, leading to overwhelming costs, unbalanced employment opportunities, inadequately prepared students, and workforce gaps. In order for the US to maintain its role in military and diplomatic global leadership, it must educate and employ highly qualified men and women.

The nation must eliminate market failures through improved information to high school students, alignment of high schools to post-secondary schools, alignment of higher education and labor demands, and accurate financial assessments for the citizenry. In the end, higher education must develop the platforms to meet the needs of the nation and guarantee that education continues to be the fuel for the nation. Education is a critical component underpinning the national security of the US. It drives the economy, fuels the nation’s competitive edge in science, technology, and innovation, develops the minds of people of all ages, raises the poor out of poverty, and is the great social equalizer. America’s greatest strengths stem from the freedom to innovate, compete, and succeed on the global stage. Without a wide base of educated and capable citizens, strengths will fade, and the US will lose its capacity to lead in the international

community.¹⁵⁸ Toward this end, higher education must develop the platforms to meet the needs of nation, which will guarantee that education continues to be the fuel for a great nation.

APPENDIX A

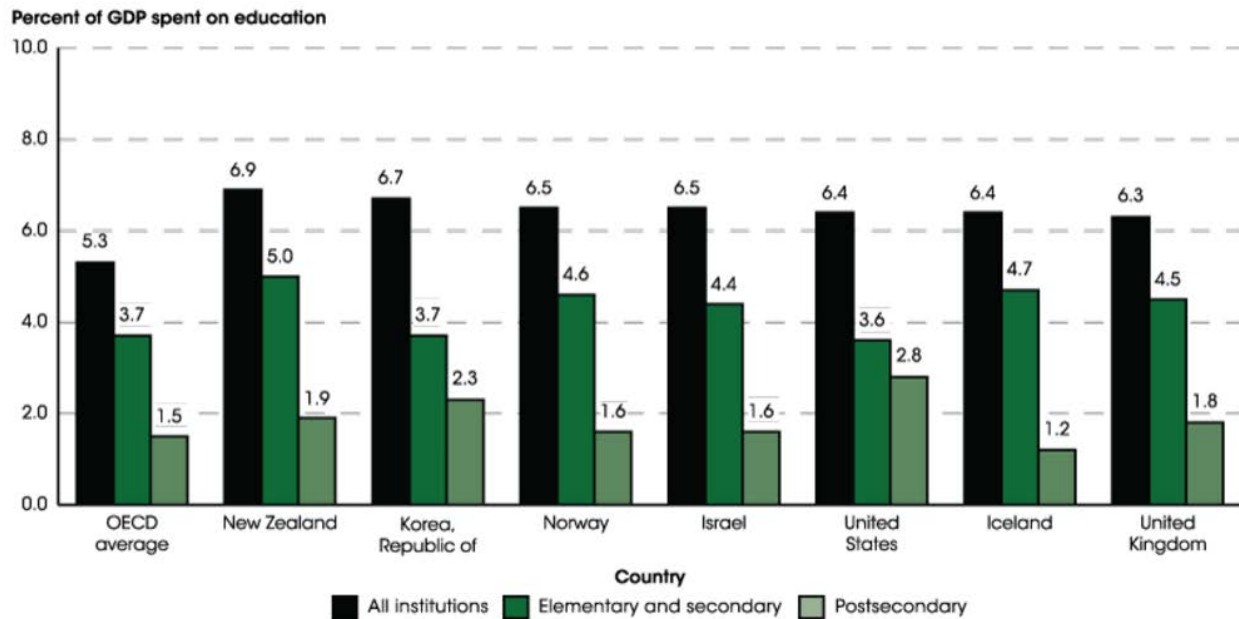
Figure 1: Annual expenditures per full-time-equivalent (FTE) student for postsecondary education in selected Organization for Economic Cooperation and Development (OECD) countries, by gross domestic product (GDP) per capita: 2012



Source: Organization for Economic Cooperation and Development (OECD), *Education at a Glance, 2015*. See *Digest of Education Statistics 2015*, table 605.10.

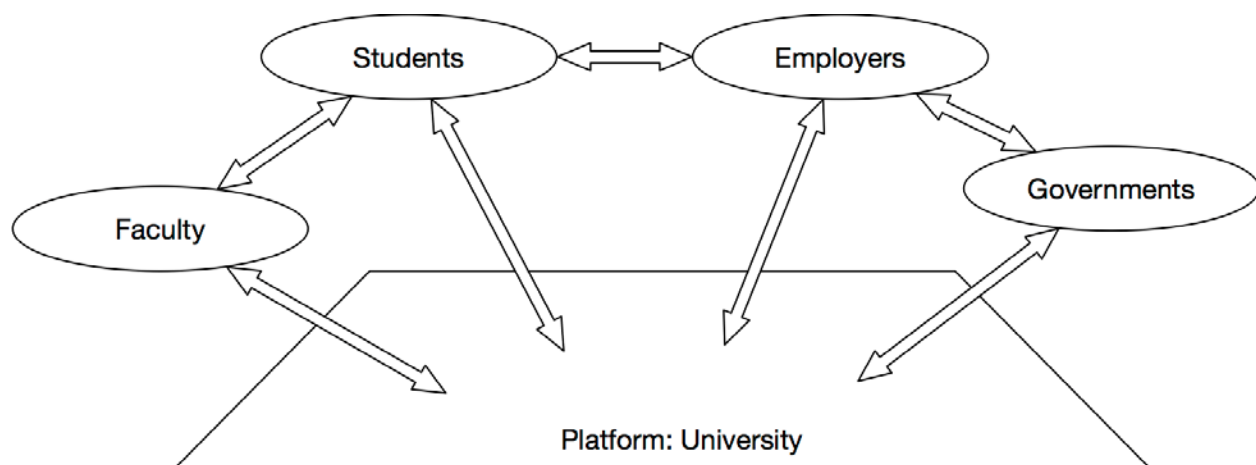
APPENDIX A - Continued

Figure 2: Direct expenditures on education as a percentage of gross domestic product (GDP) for Organization for Economic Cooperation and Development (OECD) countries with the highest percentages, by level of education: 2012



Source: Organization for Economic Cooperation and Development (OECD), *Education at a Glance, 2015*. See *Digest of Education Statistics 2015*, table 605.20.

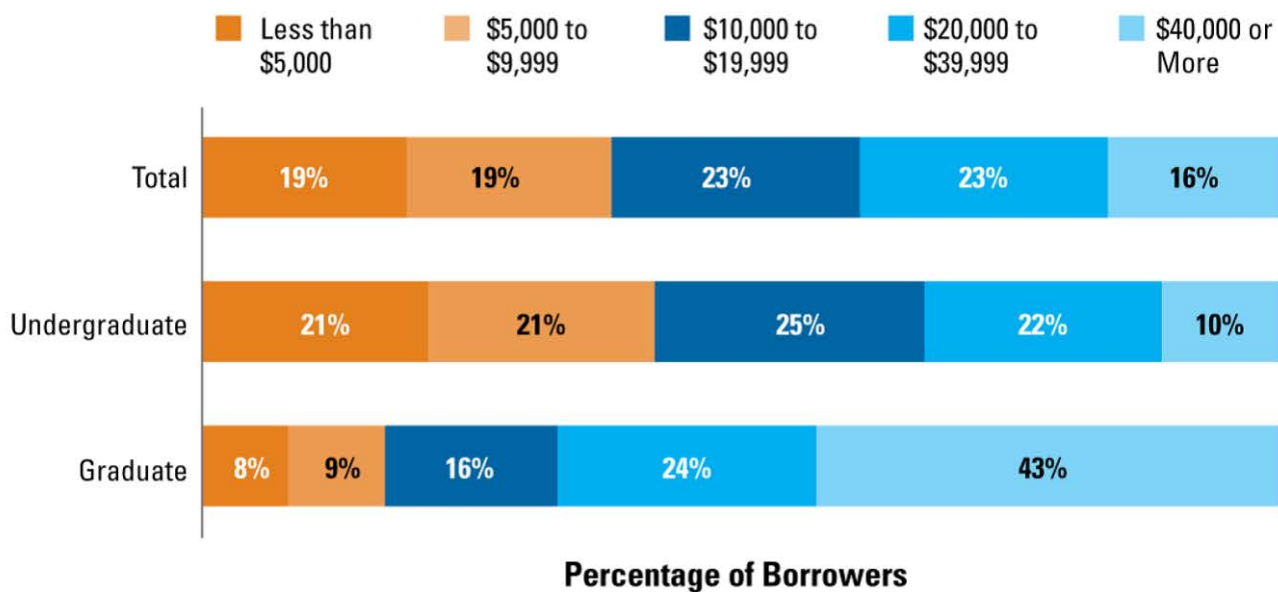
Figure 3: Depiction of Higher Education Institutions as Economic Platforms Connecting Faculty, Students, Employers, and Government



Source: Jean-Charles Rochet and Jean Tirole. *Defining Two-Sided Markets*. January 15, 2014. Accessed on May 9, 2017 at http://web.mit.edu/14.271/www/rochet_tirole.pdf

APPENDIX A - Continued

Figure 4: Distribution of Borrowers by Amount of Outstanding Education Debt, 2015



Source: The College Board, *Trends in Student Aid – 2016*. 2016, Figure 8.

APPENDIX B

Table 1. 2015 SAT Subject and Composite Scores – by Ethnic Subgroup.

2015 SAT	Tests	%	Reading	Math	Writing	TotalRM	Total RMW	Score Rank
Asian	211238	12	525	598	531	1123	1654	1
White	800236	47	529	534	513	1063	1576	2
Other	65063	4	490	519	487	1009	1496	3
American Indian	10031	1	481	482	460	963	1423	4
No response	70062	4	434	492	436	926	1362	5
Latino	322873	19	449	456	439	905	1344	6
African American	219018	13	431	428	418	859	1277	7
TOTAL	1487283							

Numbers might not add due to rounding

Note.- Table created by author, Matthew T. Pottenburgh using data from the College Board, *2015 College-Bound Seniors Total Group Profile Report* (pg. 6-9). Table compiled and in some cases, merged composite scores for the following subgroup: total mean scores by ethnicity.

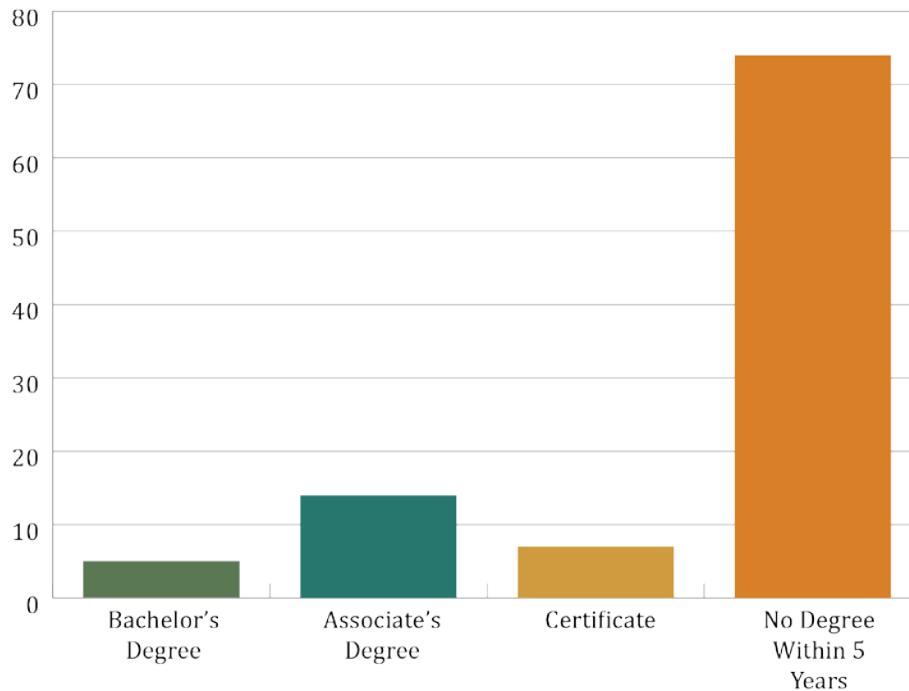
Table 2. 2015 ACT Subject and Composite Scores – by Ethnic Subgroup.

2015 ACT	Tests	%	Reading	Math	English	Science	Composite	Score Rank
Asian	93589	5	23	24.6	22.7	23.3	23.6	1
White	1057803	55	22.9	21.9	22.1	22.2	22.4	2
Other	76066	4	21.8	20.8	20.7	21.1	21.2	3
No response	129781	7	21.1	20.5	19.9	20.5	20.6	4
Latino	299920	16	19.2	19.1	17.8	19	18.9	5
American Indian	14711	1	18.4	18.1	16.6	18.2	17.9	6
African American	252566	13	17.4	17.2	15.9	17.3	17.1	7
TOTAL	1830847							

Numbers might not add due to rounding

Note.- Table created by author, Matthew T. Pottenburgh using data from ACT Incorporated, *The ACT Profile Report – National, Graduating Class 2015* (pg. 6-9). Table compiled and in some cases, merged composite scores for the following subgroup: total mean scores by ethnicity.

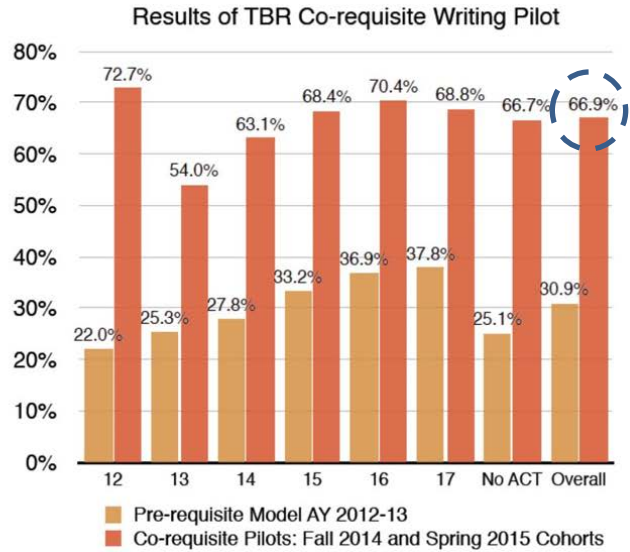
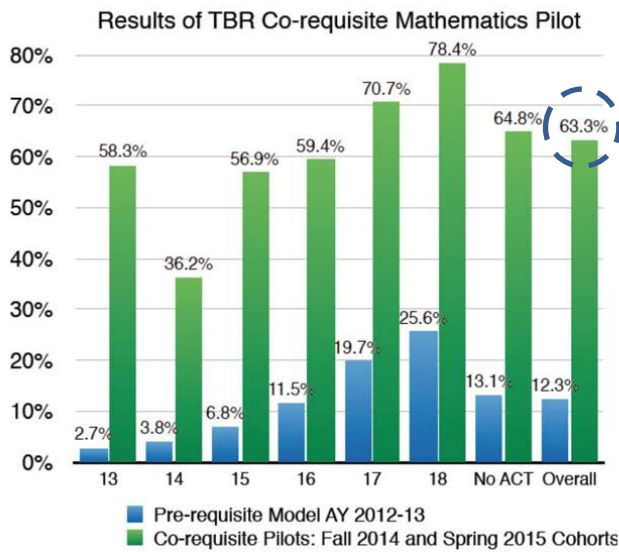
APPENDIX B – Continued

Table 3: Percent of US Students Participating in Remediation Who Earn a Degree within 5 Years of Enrollment**Table 4: Cost of Remedial Education and Sources of Remedial Education Funding**

The High Cost of Remedial Education		
	Number of students in remediation	Cost of Remediation
Public two year	995,077	\$1.88-\$2.35 billion
Public four-year	310,403	\$435-\$543 million
Total	1,305,480	\$2.31 - \$2.80 billion
Sources of Remedial Education Funding		
	Tuition and Fees	Subsidies*
Public two-year	\$513-\$642 million	\$1.37-\$1.71 billion
Public four-year	\$195-\$244 million	\$239-\$299 million
Total	\$708-\$886 million	\$1.61-\$2.01 billion
* Subsidies include revenue from state appropriations as well as revenues from other sources including private gifts and investment returns.		
SOURCE: STRONG AMERICAN SCHOOLS		

APPENDIX B – Continued

Table 5: Tennessee Board of Regents (TBR) Co-Requisite Pilot Results (Math and Writing)



Noteworthy progress made across each cohort (12, 13, 14, 15, 16, 17, 18).
NOTE: Cohort numbers DO NOT represent individual academic years.

END NOTES

1. Council on Foreign Relations, Independent Task Force Report No. 68, "U.S. Education Reform and National Security," 2012, 1.
2. Aria Bendix, "A Pause in International Students?," *The Atlantic Magazine*, March 13, 2017, accessed May 11, 2017, <https://www.theatlantic.com/education/archive/2017/03/a-pause-in-international-students/519435/>.
3. National Center for Education Statistics, "Education Expenditures by Country," May 2016, accessed May 11, 2017, https://nces.ed.gov/programs/coe/indicator_cmd.asp. This indicator uses material from the Organization for Economic Cooperation and Development (OECD) report *Education at a Glance 2015* to compare countries' expenditures on education using two measures: *expenditures per full-time-equivalent (FTE) student from both public and private sources* and *total education expenditures as a percentage of gross domestic product (GDP)*. The OECD is an organization of 34 countries whose purpose is to promote trade and economic growth. Education expenditures are from public revenue sources (governments) and private revenue sources, and include current and capital expenditures.
4. Ibid.
5. "US Education Spending Since the 1900s," accessed May 11, 2017, http://www.usgovernmentpending.com/education_spending.
6. Haydn Shaughnessy, *Shift: A Leader's Guide to the Platform Economy*, January 15, 2015, (London: The Disruption House) 39.
7. Council for Advancement and Support of Education, "Fundraising Fundamentals," accessed May 11, 2017, http://www.case.org/Publications_and_Products/Fundraising_Fundamentals_Intro/Fundraising_Fundamentals_section_1/Fundraising_Fundamentals_section_12.html.
8. Rosanna Xia, "Number of international students in U.S. colleges at an all-time high, and California is their top destination," November 25, 2016, accessed May 1, 2017, <http://www.latimes.com/local/lanow/la-me-study-abroad-students-20161124-story.html>.
9. Barack Obama, *National Security Strategy*, Office of the President of the United States, February 2015, accessed May 11, 2017, <http://nssarchive.us/national-security-strategy-2015/>.
10. Amanda Goodall, "The Top 20 Ways to Improve Your World University Ranking," November 29, 2013, accessed May 11, 2017, <https://www.timeshighereducation.com/features/top-20-ways-to-improve-your-world-university-ranking/410392.article>.

-
11. Monitor, ICEF, “New University Rankings Put the Focus on Employability,” November 30, 2016, accessed May 11, 2017, <http://monitor.icef.com/2016/11/new-university-rankings-put-the-focus-on-employability/>.
 12. Interview with President, George Mason University with National Defense University Students.
 13. Timm Boettcher, “CTE: Adapting to Meet the Demand of Today’s Economy,” February 23, 2017, accessed May 11, 2017, http://www.centraltech.edu/news_pages/2017/feb-23-2017-2.html.
 14. Doug Lederman, “For-Profit Colleges Boom,” April 7, 2010, accessed May 1, 2017, <https://www.insidehighered.com/news/2010/04/07/enroll>.
 15. U.S. Department of Education, National Center for Education Statistics, “Fast Facts,” 2016, accessed May 1, 2016, <https://nces.ed.gov/fastfacts/display.asp?id=40>.
 16. Lindsay Haskell, “The Graduation Rate of For-Profit Colleges is Shocking...,” September 20, 2014, accessed May 1, 2016, <https://www.attn.com/stories/118/graduation-rate-profit-colleges-shocking>
 17. The College Solution, “Where Most Students End Up Attending College,” October 10, 2011, accessed May 11, 2017, <http://www.thecollegesolution.com/where-most-students-end-up-attending-college/>.
 18. John-Pierre Maeli, “Could You Do More By Not Going to College? (Opportunity Cost Explained, So You Can Get It),” August 8, 2014, accessed May 2, 2017, <http://thepoliticalinformer.com/opportunity-cost/>.
 19. Seminar Interview with University of Maryland on February 28, 2017 and Massachusetts Institute of Technology Admissions leadership [hereinafter MIT Leadership] on April 3, 2017.
 20. Department of Health Policy and Management Gillings School of Global Public Health University of North Carolina at Chapel Hill, “HPM Expectations for Promotion of Research Track Faculty”, June 23, 2015, accessed May 2, 2017, <https://sph.unc.edu/files/2013/10/HPM-Research-Track-Expectations-6-22-2015.pdf>.
 21. Office of the Secretary of Defense Studies and FFRDC Management Office, “Engagement Guide Department of Defense University Affiliated Research Centers (UARC),” April 2014, accessed May 3, 2017, http://www.acq.osd.mil/chieftechologist/publications/docs/20130426_UARC_EngagementGuide.pdf.
 22. Harvard University, “Campus Interview Program,” 2017, accessed May 3, 2017, <http://ocs.fas.harvard.edu/oci>.

-
23. Courtney Comstock, "Want A Great Job? Don't Go To Second-Tier Schools Like Columbia And MIT," January 11, 2011, accessed May 3, 2017, <http://www.businessinsider.com/harvard-princeton-and-yale-2011-1>.
24. MIT Leadership.
25. Ibid.
26. John Schoen, CNBC, "Why Does a College Degree Cost So Much?" June 16, 2015, accessed May 9, 2017, <http://www.cnbc.com/2015/06/16/why-college-costs-are-so-high-and-rising.html>.
27. David O. Lucca, Taylor Nadauld, and Karen Shen, "Credit Supply and the Rise in College Tuition: Evidence from the Expansion in Federal Student Aid Programs," February 2017, accessed May 4, 2017, https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr733.pdf.
28. Michael Mitchell, Michael Leachman, and Kathleen Masterson, "Funding Down, Tuition Up," August 15, 2016, accessed May 4, 2017, <http://www.cbpp.org/research/state-budget-and-tax/funding-down-tuition-up>.
29. Michael Mitchell, Michael Leachman, and Kathleen Masterson, "Funding Down, Tuition Up," Center on Budget and Policy Priorities, August 15, 2016, accessed May 11, 2017, <http://www.cbpp.org/research/state-budget-and-tax/funding-down-tuition-up>.
30. The College Board, "Lifetime Earnings by Education Level," 2017, accessed May 3, 2017, <https://trends.collegeboard.org/education-pays/figures-tables/lifetime-earnings-education-level>.
31. U.S. Department of Education, "College Scorecard Data," January 13, 2017, accessed May 4, 2017, <https://collegescorecard.ed.gov/>.
32. The Library of Economics and Liberty define "rent-seeking", as: "People are said to seek rents when they try to obtain benefits for themselves through the political arena. They typically do so by getting a subsidy for a good they produce or for being in a particular class of people, by getting a tariff on a good they produce, or by getting a special **regulation** that hampers their competitors." accessed May 11, 2017, <http://www.econlib.org/library/Enc/RentSeeking.html>.
33. Danielle Douglas-Gabriel, "Is the federal government trying to take down the for-profit college industry?," September 8, 2016, accessed May 4, 2017, https://www.washingtonpost.com/local/education/is-the-federal-government-trying-to-take-down-the-for-profit-college-industry/2016/09/08/effb7ffe-75dd-11e6-b786-19d0cb1ed06c_story.html?utm_term=.d3e13d79f6ae.
34. Tejvan Pettinger, "Information Failure," economicshelp.org, accessed May 11, 2017, <http://www.economicshelp.org/blog/glossary/information-failure>

-
35. U.S. Department of Education, “A Blueprint for Reform, The Reauthorization of the Elementary and Secondary Education Act” accessed May 11, 2017, <https://www2.ed.gov/policy/elsec/leg/blueprint/blueprint.pdf> [emphasis added].
36. Jillian Gordon, PBS, “Why I’m Telling Some of My Students Not to Go to College,” April 15, 2015, accessed May 11, 2017, <http://www.pbs.org/newshour/updates/im-telling-students-go-college/>.
37. Susan Dynarski, “The Wrong Way to Fix Student Debt,” May 6, 2017, accessed May 7, 2017, https://www.nytimes.com/2017/05/06/upshot/the-wrong-way-to-fix-student-loans.html?_r=0.
38. Complete College America. “REMEDICATION: Higher Education’s Bridge to Nowhere,” April, 2012, accessed May 11, 2017, www.completecollege.org.
39. Ibid, 10.
40. Ibid, 5.
41. Jason Amos, “Diploma to Nowhere,” Strong American Schools, October 6, 2008, accessed May 9, 2017, <http://all4ed.org/articles/diploma-to-nowhere-report-pegs-college-remediation-cost-in-excess-of-2-billion-annually/>.
42. Karen Arenson, The New York Times, “Study Finds College-Prep Courses in High School Leave Many Students Lagging,” May 16, 2007, accessed May 11, 2017, <http://www.nytimes.com/2007/05/16/education/16report.html>.
43. Richard Vedder, “The Real Reasons College Costs So Much,” October 11, 2013, mises.org, accessed May 11, 2017, <https://mises.org/blog/richard-vedder-real-reasons-college-costs-so-much>.
44. Robert Farrington, “Too Poor For College, Too Rich For Financial Aid,” Forbes Magazine, June 17, 2014, accessed May 11, 2017, <https://www.forbes.com/sites/robertfarrington/2014/06/17/too-poor-for-college-too-rich-for-financial-aid/#64efbcf06922>.
45. Kim Clark, “A Failing Financial Aid System Keeps Students Out of College, U. S. News and World Report, September 4, 2008, accessed May 11, 2017, <https://www.usnews.com/education/articles/2008/09/04/a-failing-financial-aid-system-keeps-students-out-of-college>.
46. Bureau of Labor Statistics, “College tuition and fees increase 63 percent since January 2006.” United States Department of Labor, August 30, 2016, accessed May 11, 2017, <https://www.bls.gov/opub/ted/2016/college-tuition-and-fees-increase-63-percent-since-january-2006.htm>.

-
47. Michelle Jamrisko and Ilan Kolet, "College Tuition Costs Soar: Chart of the Day," August 18, 2014, accessed May 11, 2017, <https://www.bloomberg.com/news/articles/2014-08-18/college-tuition-costs-soar-chart-of-the-day>.
48. Department of Education, "Default Rates", Dept of Education, accessed April 14, 2017, <https://studentaid.ed.gov/sa/about/data-center/student/default>.
49. The College Board, "2015 College-Bound Seniors Total Group Profile Report," The College Board, 2015.
50. ACT Inc., "The 2015 ACT Annual Report," ACT Inc., 2015.
51. Massachusetts Department of Education, *The Degree Gap: Honing In on College Access, Affordability & Completion in Massachusetts*.
52. During the Eisenhower School Industry Field Study visit to China, students witnessed firsthand China's emphasis on STEM curriculum and careers during a visit to the Shanghai Technical Institute of Electronics and Information.
53. Jordan Friedman, "Study: Enrollment in Online Learning Up, Except at For-Profits," *USNEWS*, 9 February 2016.
54. Peter Jacobs, "The 10 countries with the most top-ranked universities," *Business Insider: Education*, October 6, 2015, accessed May 3, 2017, <http://www.businessinsider.com/countries-with-most-top-ranked-universities-2015-10/#10--japan-24-universities-1>.
55. Ibid.
56. Aneki, *Aneki.Com: Rankings + Records*, accessed May 3, 2017, <http://www.aneki.com/universities.html>.
57. Higher Education, "U.S. Supreme Court Cases in Higher Education," accessed March 19, 2017, <http://lawhigheredu.com/139-us-supreme-court-cases-in-higher-education.html>.
58. The National Center for Public Policy and Higher Education [hereinafter NCPPHE], "Purposes, Policies, Performance: Higher Education and the Fulfillment of a State's Public Agenda," February 2003, National Center Report #03-1, 1.
59. Institute of Education Sciences [hereinafter IES], "The Condition of Education 2016," National Center for Education Statistics, U.S. Department of Education, 248, accessed March 20, 2017, <http://nces.ed.gov/pubsearch>.
60. Kermit Kaleba, "More Than Grants: The Role of the Federal Government in Higher Education," National Skills Coalition, August 28, 2015, accessed March 10, 2017, <https://evollution.com/author/kermit-kaleba/>.
61. NCPPHE, 26.

62. IES, 103.

63. Adrienne Lu, "How State Lawmakers Control State Universities," *Governing: The States and Localities*, April 24, 2014, accessed April 9, 2017, <http://www.governing.com/news/headlines/how-state-lawmakers-control-state-universities.html>.

64. NCPPHE, 1.

65. National Association of Student Financial Aid Administrators, "State Financial Aid Programs," accessed March 2, 2017, https://www.nasfaa.org/State_Financial_Aid_Programs.

66. Massachusetts Department of Higher Education, "Quick Guide for Students," accessed March 27, 2017, <http://www.mass.edu/osfa/programs/quickguide.asp>.

67. Karen Dewitt, "New York's Free Tuition for Some Students Gets Blowback," *National Public Radio*, April 20, 2017, accessed May 1, 2017, <http://wnpr.org/post/new-yorks-free-tuition-some-students-gets-blow-back>.

68. Ibid.

69. Teaching panel interview at NDU including a high school principal, high school teacher, and two college professors, February 27, 2017.

70. Fact Sheet: ESSA Title IV Part A Understanding the Flexible Block Grant, accessed May 11, 2017, https://www.iste.org/docs/advocacy-resources/title-iv-fact-sheet-for-essa_final.pdf.

71. Ibid.

72. Basmat Parsad and Laurie Lewis. "Remedial education at degree-granting postsecondary institutions in fall 2000: Statistical analysis report (NCES 2004-101)" Washington, DC: U.S. Department of Education, National Center for Education Statistics. (2003); and Pamela Burdman. "Where to Begin: The Evolving Role of Placement Exams for Students Starting College." *Jobs for the Future*. Boston MA. (2012).

73. American Institutes for Research, "How Career and Technical Education Can Help Students Be College and Career Ready: A Primer," American Institutes for Research, March 2013.

74. Ibid.

75. Drive to 55 Alliance, "Tennessee LEAP," Tennessee State Government, accessed 17 April 2017, <http://driveto55.org/initiatives/tennessee-leap/>.

76. Dave Roos "How the FAFSA Works," *HowStuffWorks.com*. February 16, 2010, accessed May 11, 2017, <http://money.howstuffworks.com/personal-finance/college-planning/financial-aid/fafsa.htm>.

77. Farrington.

78. Ibid.

79. Bob Kerry, Rosabeth Moss Kanter, Bruce Nolop, Jon Erickson, Robert Howell, Kenneth Freeman, Eric Spiegel, Gianpiero Petriglieri, Les Newman, "Why Aren't Companies Getting Graduates With the Skills They Need?" The Wall Street Journal, October 14, 2013.

80. Gallup, Inc., "One in Six US Grads Say Career Services Was Very Helpful," Gallup, Inc., accessed May 11, 2017, http://www.gallup.com/poll/199307/one-six-grads-say-career-services-helpful.aspx?g_source=Education&g_medium=newsfeed&g_campaign=tiles.

81. Ibid.

82. William C. Symonds, Robert Schwartz, and Ronald F. Ferguson, "Pathways to Prosperity: Meeting the Challenge of Preparing Young Americans for the 21st Century," Harvard Graduate School of Education, May 11, 2017.

83. Teaching Panel interview at NDU including a high school principle, high school teacher, and two college professors, February 2011 and February 2017.

84. Sundar Kumarasamy, VP Enrollment Management, Interview by Nathan Colunga, 4 April 2017.

85. Ibid.

86. Ibid.

87. Massachusetts Department of Education, The Degree Gap: Honing In on College Access, Affordability & Completion in Massachusetts.

88. Ibid.

89. Drive to 55 Alliance.

90. Department of Defense Operations and Maintenance Programs FY 2016 Budget Justification. Accessed on April 23, 2017 at <https://go.usa.gov/x5BUW>.

91. Ibid.

92. DoD Health Program FY 2016 Budget Estimate. Accessed on April 23, 2017 at <https://go.usa.gov/x5Z9G>.

93. Department of Defense Instruction 1322.25, Change 3, July 7, 2014.

-
94. O'Reilly, Patrick, "The State Planning Process in Vocational Education: Project Baseline Supplemental Report" (Office of Education (DHEW), Washington, D.C. December 1975), 6.
95. Barrett, 1.
96. Symonds, 2.
97. Complete Education, 6.
98. Somerville Public Schools Education Plan, 55.
99. Symonds, 3.
100. Ray Hart, Michael Casserly, Renata Uzzell, Moses Palacios, Amanda Corcoran, Liz Spurgeon. *Student Testing in America's Great City Schools – An Inventory and Preliminary Analysis*. (Washington D.C.: Council of Great City Schools, 2015), 10.
101. The College Board, "2015 College-Bound Seniors Total Group Profile Report," The College Board, 2015.
102. ACT Inc., "The 2015 ACT Annual Report," ACT Inc., 2015.
103. Rakesh Kochhar and Richard Fry, "Wealth inequality has widened along racial, ethnic lines since end of the Great Recession," Pew Research Center FactTank, 2014. 4.
104. ACT Inc., "The 2015 ACT Annual Report," ACT Inc., 2015.
105. Brandon Na. *How much money is spent on standardized tests in the U.S. annually?* Accessed May 11, 2017, <https://www.quora.com/How-much-money-is-spent-on-standardized-tests-in-the-U-S-annually> (Mountain View: Quora, 2016).
106. Ibid, 10.
107. Rebecca Klein. *If You Want A Good ACT Score, It Really, Really Helps To Be Rich*. Accessed May 11, 2017, http://www.huffingtonpost.com/2014/07/18/act-score-family-income_n_5600065.html (New York: The Huffington Post, 2014).
108. National Center for Education Statistics. *What are the average scores for students taking the SAT?, 1986-2015*. (Washington D.C.: National Center for Education Statistics, 2015), 1.
109. National Center for Education Statistics. *Status and Trends in the Education of Racial and Ethnic Groups*. (Washington D.C.: National Center for Education Statistics, 2015), 82.

-
110. Rakesh Kochhar and Richard Fry. *Wealth inequality has widened along racial, ethnic lines since end of the Great Recession*. (Washington D.C.: Pew Research Center FactTank, 2014), 1-2.
111. Josh Zumbrun. *SAT Scores and Income Inequality: How Wealthier Kids Rank Higher*. October 7, 2014, accessed May 11, 2017, <https://blogs.wsj.com/economics/2014/10/07/sat-scores-and-income-inequality-how-wealthier-kids-rank-higher/>.
112. Anemona Hartocollis, "Tutors See Stereotypes and Gender Bias in SAT - Testers See None of the Above," *New York Times*, June 26, 2016, accessed May 11, 2017, <https://www.nytimes.com/2016/06/27/us/tutors-see-stereotypes-and-gender-bias-in-sat-testers-see-none-of-the-above.html?r=0>.
113. Nancy Griesemer, "James Madison University goes "test-optional" for 2017-2018," *Admissions Intel*, May 6, 2017, accessed May 11, 2017, <http://admissionsintel.com/james-madison-university-goes-test-optional-for-2017-2018/>
114. Ronald Phipps. "College Remediation, What It Is, What It Costs, What's at Stake." *The Institute for Higher Education Policy*. (December, 1998).
115. Interview with Janet Bush, Editorial Assistant to Associate Vice President, Student Services & Enrollment Management, Northern Virginia Community College. (March 16, 2017).
116. Complete College America. "REMEDICATION: Higher Education's Bridge to Nowhere," April, 2012, accessed May 11, 2017, www.completecollege.org.
117. Ibid, 10.
118. Michael Kurlaender. "Collegiate Remediation: A Review of the Causes and Consequences." *College Board Advocacy & Policy Center*. (September, 2012) 1.
119. Interview with Mr. Marc Cohen, Principal of Seneca Valley High School, Germantown, MD. (March 17, 2017).
120. Complete College America, 5.
121. *Strong American Schools, Diplomat to Nowhere*. Washington, DC. (2008).
122. Elizabeth Zachary and Emily Schneider, *Building foundations for student readiness: A review of rigorous research and promising trends in developmental education*. Paper presented at the NCPR Developmental Education Conference. New York, NY: National Center for Postsecondary Research. (2010).
123. Interview with Sundar Kumarasamy, Vice President, Enrollment Management, Northeastern University. (April 4, 2017).

124. Pamela Burdman, "Where to Begin: The Evolving Role of Placement Exams for Students Starting College." Jobs for the Future. Boston MA. (2012).

125. Legislature of the State of Wyoming Enrolled Act No. 65: 2012 Budget Session. (2012), accessed May 11, 2017, <http://legisweb.state.wy.us/2012/Enroll/SF0057.pdf>.

126. Interview with Dr. Mitchell E. Chester, Commissioner of Higher Education, Massachusetts Department of Elementary and Secondary Education. (April 3, 2017).

127. Rhonda Epper and Elaine Baker, *Technology solutions for developmental math: An overview of current and emerging practices*. Report prepared with funding from the William and Flora Hewlett Foundation and the Bill & Melinda Gates Foundation. (2009).

128. Angela Boatman, *Evaluating Institutional Efforts to Streamline Postsecondary Remediation: The Casual Effects of the Tennessee Developmental-Course Redesign Initiative on Early Student Academic Success*. (An NCPR Working Paper). New York, NY: National Center for Postsecondary Research. (2012).

129. Bill and Melinda Gates, "Postsecondary Success," accessed May 11, 2017, <http://postsecondary.gatesfoundation.org/areas-of-focus/solutions/remedial-education/>.

130. Deborah Borocho, Jim Filpot, Laura Hope, Robert Johnstone, Pamela Mery, Andreea Serban, Bruce Smith and Robert Gardiner. "Basic Skills as a Foundation for Student Success in California Community Colleges, Part I: Review of Literature and Effective Practices," March, 2007, accessed May 11, 2017, <http://www.cccbsi.org/Websites/basicskills/Images/InstructionalPractices.pdf>.

131. Dr. Kecia Ray and Diana Laufenberg, "Guide to Choosing Digital Content and Curriculum," 2016, accessed May 11, 2017, http://www.cosn.org/sites/default/files/CDE16%20DOE%20GUIDE_V.pdf.

132. Michelle Jamrisko and Ilan Kolet, "College Tuition Costs Soar: Chart of the Day," August 18, 2014, accessed May 11, 2017, <https://www.bloomberg.com/news/articles/2014-08-18/college-tuition-costs-soar-chart-of-the-day>.

133. Director, The Center For College Affordability and Productivity, accessed May 11, 2017, <http://centerforcollegeaffordability.org/>.

134. Kyung M. Song, "Patty Murray: Crushing college costs hurt students, economy," The Seattle Times, June 4, 2014, accessed May 11, 2017, <http://www.seattletimes.com/seattle-news/patty-murray-lsquo-crushing-rsquo-college-costs-hurt-students-economy/>.

135. Vedder.

136. Ibid.

137. Some institutions, including the Massachusetts Institute of Technology, also use the College Board's CSS/PROFILE Financial Aid Form to screen applicants for non-federal institution scholarships and grants, accessed May 11, 2017, <https://student.collegeboard.org/css-financial-aid-profile>.

138. Farrington.

139. There are a number of innovative tuition policies currently underway in several states and several more states are giving them consideration. These include linking tuition with institutional performance, creating a tuition stabilization fund from annual appropriations (Maryland), freezing tuition, providing tuition tax credits and deductions, guaranteeing a fixed tuition for the duration of a student's enrollment, linking tuition with financial aid, and establishing trade-offs whereby non-resident students pay increased tuition rates to offset reductions or freezes in state resident tuition rates. Dustin Weeden, "Tuition Policy," National Conference of State Legislatures.org, September 8, 2015, accessed May 11, 2017, <http://www.ncsl.org/research/education/tuition-policy.aspx>.

140. Dustin Weeden, "Tuition Policy," National Conference of State Legislatures.org, September 8, 2015, accessed May 11, 2017, <http://www.ncsl.org/research/education/tuition-policy.aspx>.

141. Emily Schiffer; this essay contains excerpts from an essay submitted in fulfillment of a requirement for the National Defense University course, China and the International Order, March 2017.

142. Organization for Economic Cooperation and Development [hereafter OECD], "Country Note: PISA 2015 High Performers," accessed February 16, 2017, <https://www.oecd.org/pisa/PISA-2015-china.pdf>. 1.

143. Marc S. Tucker, *Surpassing Shanghai: An Agenda for American Education Built on the World's Leading Systems*, (Cambridge: Harvard Education Press, 2015), 21.

144. Ibid.

145. Ibid.

146. Cai Yiwen, Sixth Tone, "Outside Shanghai, China Fails to Ace PISA Test," December 8, 2016, accessed February 10, 2017, <http://www.sixthtone.com/news/china-drops-top-tenth-pisa-education-ranking>.

147. OECD, 1.

148. Tom Loveless, "PISA's China Problem," Brookings Institute, October 9, 2013, accessed January 27, 2017, <https://www.brookings.edu/research/pisas-china-problem/>.

149. Ibid.

150. Ibid.

151. Project-Partner, “China’s Education Gap—A Surprising Factor of Rural Poverty,” accessed February 18, 2017, <http://projectpartner.org/poverty/chinas-education-gap-a-surprising-factor-in-rural-poverty/>.

152. Abby Jackson, Business Insider, “China has a major issue with its educational system,” May 9, 2015, accessed January 21, 2017, <http://www.businessinsider.com/china-has-a-major-issue-with-its-educational-system-2015-5>.

153. Bruce Fuller, The Atlantic, “A Shifting Education Model in China,” December 14, 2015, accessed January 19, 2017, <https://www.theatlantic.com/education/archive/2015/12/china-education-system/420234/>.

154. Ibid.

155. Mark Magnier, The Wall Street Journal, “China’s Coming Education Crisis,” March 20, 2015, accessed January 19, 2017, <http://blogs.wsj.com/chinarealtime/2015/03/20/chinas-coming-education-crisis/>.

156. Ibid.

157. Condoleezza Rice and Joel Klein, “Rice, Klein: Education keeps America safe,” March 20, 2012, accessed May 16, 2017, <http://www.cnn.com/2012/03/20/opinion/rice-klein-education/>.

158. Ibid.