EDUCATION

ABSTRACT: The education industry is vital to US national security. Serving as the foundation for all industries, education in America fuels the world's most powerful economic and military engines and enables the Nation to enjoy an unprecedented standard of living. For this success to continue, the education industry must respond to globalization, rapidly advancing technologies, and demographic changes in the US. The industry is capable of making the needed adjustments, but many challenges exist. Poor achievement among minority students, low teacher retention, powerful teacher unions, shortages in graduates with advanced science and math skills, and school-choice issues must be addressed. Federal policies aimed at these challenges can lead to success.

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PLACES VISITED:

Domestic:
American Federation of Teachers, Washington, DC
Chelsea Public Schools/Boston University Partnership, Boston, MA
Boston Latin School, Boston, MA
Boston Renaissance Charter School, Boston, MA
Council of Great City Schools, Washington, DC
Educational Testing Service, Washington, DC
Focus HOPE, Detroit, MI
General Motors University, Detroit, MI
Harvard Graduate School of Education, Cambridge, MA
Home School Legal Defense Association, Purcellville, VA
Houghton-Mifflin, Inc., Boston, MA
Maryland State Department of Education, Baltimore, MD
Massachusetts Institute of Technology, Cambridge, MA
Minuteman Regional High School of Applied Arts and Sciences, Lexington, MA
Montgomery County Public Schools, Rockville, MD
Mountain View Alternative High School, Centreville, VA
Northern Essex Community College, Haverhill, MA
Potomac Job Corps Center, Washington, DC
Raytheon Corporation, Lexington, MA
Superintendent, District of Columbia Public Schools
Thomas Jefferson High School for Science and Technology, Alexandria, VA
University of Phoenix Distance Learning, DC Metro Liaison, Washington, DC
US Department of Education, Washington, DC
US House of Representatives, Committee on Education and Workforce, Washington, DC
World Bank Human Development Network, Washington, DC

International:
British Parliament, Education Committee, London, England
Department for Education and Skills, London, England
Deutsche Bank, Frankfurt, Germany
European Aeronautic Defense Systems, Ulm, Germany
Enfield County School, Enfield, England
Goethe Gymnasium, Frankfurt, Germany
Ministry of Science, Research, and Art, Stuttgart, Germany
Qualifications and Curriculum Authority, London, England
Teacher Training Agency, London, England
University of Cambridge, Cambridge, England

INTRODUCTION:

The US education industry produces the Nation's most vital national security resource—sons and daughters educated in a variety of subjects. Civics, history, social studies, and political science cultivate democratic values and instill an understanding of America's role in the world. Math, science, and technology build the foundation needed to compete in the Information Age. Collectively, educated citizens are the economic backbone of the country. They provide the human and materiel resources needed to build a strong military force and enable government leaders and institutions to work effectively within the domestic and international environments. In the words of President John F. Kennedy, "A free Nation can rise no higher than the standard of excellence set in its schools and colleges."[i]

The US education industry took its present form following World War II. While the industry was expanding to serve the needs of veterans and the ensuing "baby boomer" generation, the Supreme Court's *Brown vs. Board of Education* ruling in 1954 required the industry to focus on providing equity in education.[ii] From then until the turn of the century, the education system satisfied America's national security requirements—it fueled the world's most powerful economic engine, produced a superior military capability, and enabled one of the most diverse populations of any country to thrive.

Despite these successes, however, two negative trends emerged during this period. First, overall student performance began to decline, prompting the government in 1983 to publish A Nation at Risk that warned of a "rising tide of mediocrity" in education that threatened future national security.[iii] Second, minority and low-income students were achieving at levels far below that of other socioeconomic groups, a condition that perpetuated poverty and other social ills.[iv] Although both trends have seen some improvement, the significance of these and other shortfalls within the US education industry is magnified by three factors.

Globalization, rapidly advancing technologies, and shifting US demographics represent a new strategic environment that increases the importance of education to national security. Globalization's radically expanding economic competition leaves no room for US industries to be less than fully optimized. Rapidly advancing technologies yield untold capabilities and reward the extremely talented who develop and exploit them. Shifting US demographics will soon create a majority of minorities,[v] and America's well being will be defined largely by the success of those minorities.

With an eye toward this new environment, the Education Industry Study Seminar conducted an executive-level analysis of the US education industry to assess national security implications and offer policy recommendations. Seminar members met experts from across the industry, including local, state, federal, and international government officials and corporate leaders. The seminar gained insights into policy development and resource allocation issues and explored topics ranging from urban school challenges to the international economic aspects of education. Seminar members conducted research on a variety of industry subjects, the results of which are included in this report.

To begin, the report defines the education industry and assesses its current state. The report next describes the most significant challenges faced by the industry and offers an outlook into the future. Finally, the report discusses the role of government and provides recommendations to strengthen the industry's contributions to national security.

THE INDUSTRY DEFINED:

The US education industry is extremely large, representing 7.6 percent of the Gross Domestic Product (GDP) and encompassing one quarter of the US population.[vi] Expenditures reached $852 billion last year and have grown as a percentage of the GDP for 20 years.[vii] Spending is spread across primary schools (kindergarten to sixth grade), secondary schools (seventh to twelfth grade), vocational schools, post-secondary schools (community colleges, four-year colleges, universities, and non-collegiate institutions), and education and training services (employer training, tutoring, textbooks, etc.).

Students, teachers, and administrative staff are the industry's primary participants. Kindergarten-to-twelfth grade (K-12) includes 53.6 million students, 3.5 million teachers, and 3.2 million support staff.[viii] Post-secondary schools include 15.6 million students, 0.8 million teachers, and 0.2 million support staff.[ix] Figure 1 illustrates the proportions of participants and expenditures in these industry sectors.

Given the education industry's size, an in-depth assessment of all sectors is beyond the scope of this report. Instead, this paper focuses on K-12 because it is most important to national security. K-12 sets the foundation for all subsequent education and training and prepares citizens for entry into the labor force. Further, it is the largest sector within the industry, has the biggest challenges, and is compulsory up to age 16. Brief assessments of the other key sectors are provided in an essay on page 21.

The K-12 system includes public (traditional, charter, and magnet) and private (parochial and non-parochial) schools. Nearly 90 percent of K-12 students attend public schools.[x] Traditional public schools are most common, offering a balanced curriculum to a broad student body. Charter schools represent 3.2 percent of the public schools and address specific community needs, often cater to a narrow student body, and operate with more autonomy than traditional public schools.[xi] Magnet schools are more rare and offer concentrated curriculums for students with specific interests and advanced talents. Private schools operate outside of government control because government funding is not normally provided. However, private schools receive public funds in at least five states and the District of Columbia, but only with state and local government approval.[xii]

Federal, state, and local governments play varying roles within the education system's decentralized framework. The federal government ensures all Americans have access to education and promotes equity in the quality of education. Congress provides funding to states, schools, and students, contributing about 10 percent of the total K-12 public school expenditures.[xiii] State governments establish curriculums and standards of learning, provide technical assistance, and license public schools and teachers. The states provide, on average, 50 percent of the funding for K-12 public schools, though this level varies among states.[xiv] Local governments provide the remaining funding (about 40 percent) to their local school districts. These districts, numbering 15,000 across the country, exercise significant autonomy in implementing the states' curriculums.[xv]

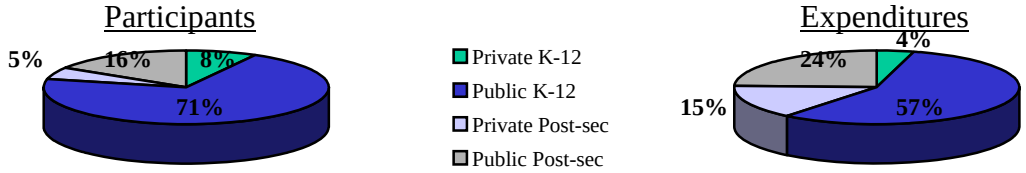

Figure 1. Proportions of participants/expenditures in K-12 and post-secondary education.

CURRENT CONDITION:

The current condition of the K-12 education industry may be assessed using four factors: student learning, costs, productivity growth rates, and the use of information technology. Student learning represents the industry's primary output. Costs reflect the industry's inputs. Productivity trends give a sense of cost-effectiveness and progress. And the extent in which information technology is used reveals the industry's ability to adapt and exploit new capabilities.

Student learning is the most important of these factors and is commonly assessed by evaluating and comparing standardized exam scores. The most recent available data indicate that overall US student learning in reading, math, and science has generally improved during the last 30 years.[xvi] Figure 2 shows the results of National Assessment of Educational Progress (NAEP) tests administered to students in fourth, eighth, and twelfth grades. Scores for fourth- and eighth-grade students have improved in each subject over the 1970's levels. Reading scores for twelfth-grade students have improved, but math and science scores have decreased slightly.

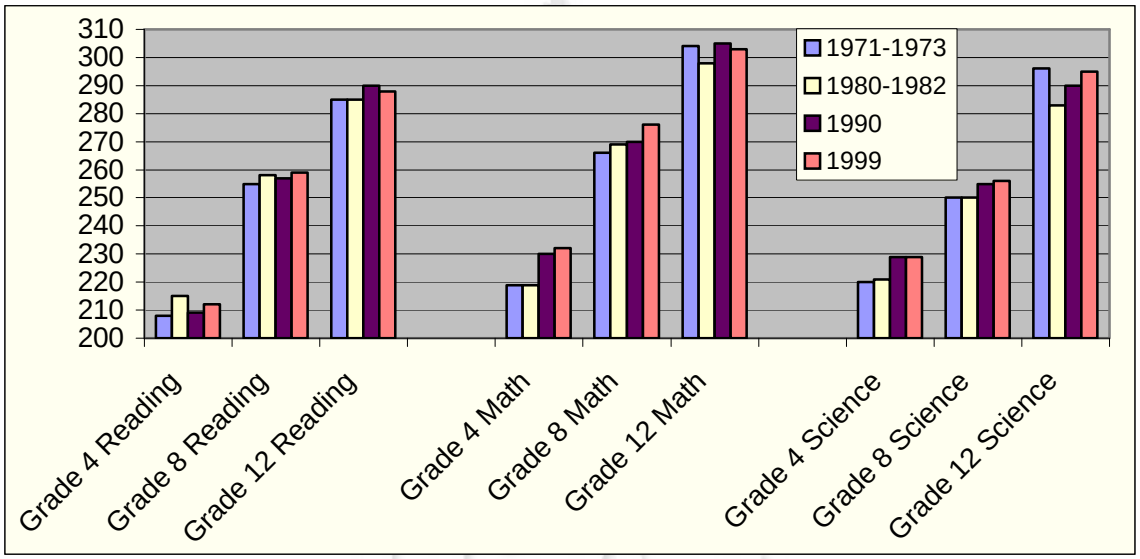

Figure 2. NAEP reading, math, and science scores for 4th, 8th, and 12th grade students.

The performance of minority groups has likewise improved, though they continue to achieve at levels well below the national average. Table 1 shows recent NAEP results disaggregated by race.[xvii] The performance disparity between Caucasian students and African-American and Hispanic students remains significant, though the gap has closed in recent years. This disparity is becoming a greater concern because minorities represent a growing percentage of the US population. Unless minority achievement improves, the average education level in the US will drop.

Maximum Score Is 500	**Math 1990** Grade 4 / 8 / 12	**Math 2003** Grade 4 / 8 / 12	**Reading 1990** Grade 4 / 8 / 12	**Reading 2003** Grade 4 / 8 / 12
White	220 / 270 / 300	243 / 288 / 308	224 / 267 / 298	229 / 272 / 294
Black	188 / 237 / 268	216 / 252 / 275	192 / 237 / 273	198 / 244 / 267
Hispanic	200 / 246 / 276	222 / 259 / 283	197 / 241 / 278	200 / 245 / 272

Table 1. NAEP math and reading test scores from 1990 and 2003 disaggregated by race.

While standardized test scores within the US may be compared in order to draw reasonable conclusions about student achievement, international and US standardized test scores can be compared only with caution. Some international scores are inflated because only the most talented students take the exams.[xviii] With this caution in mind, the most recent data available ranks American students 19th in math and 18th in science out of 38 nations based on the 1999 Trends in International Mathematics and Science Study. Singapore (1st in math, 2nd in science), Taiwan (1st in science), and the Republic of Korea (2nd in math) achieved the top rankings.[xix] US performance in literacy appears no better, ranking 12th out of 23 nations in the International Adult Literacy Survey.[xx] Although these rankings suggest there is plenty of room for US students to improve, education experts warn against drawing such a conclusion based on these data sets alone.[xxi]

High school completion rate is another metric used to assess student learning. The US high school completion rate of 87 percent in 2000 represents an increase from the 83 percent rate in 1972 and is consistent with the improving test score data during that period.[xxii] High school completion rates among minorities continue to lag behind Caucasians; 84 percent of school-age African-Americans and 64 percent of Hispanics completed high school in 2000 compared to 92 percent of Caucasians.[xxiii]

In an effort to raise student achievement and reduce this gap, the federal government passed the No Child Left Behind Act of 2001.[xxiv] As the latest in a series of legislative acts that began with national summits of state governors in the 1990s, this newest law aims to raise overall education levels and reduce the number of low-achieving students, particularly those from minority and low-income families. Among the law's provisions, it requires states to measure individual student progress against standards of learning that are established by each state. As a result, school districts are now focusing on the performance of *all* students. States may opt not to follow the law, but they lose significant federal funding. Some states have asserted that the federal funds attached to the program are not adequate or the guidelines are misdirected.[xxv] Seminar field visits and individual research, though limited, revealed little evidence to support these assertions.

Meanwhile, the costs to achieve these results have been growing. K-12 per capita spending in America is among the highest in the world, averaging nearly $10,000 per student.[xxvi] During the last 20 years, the average expenditure per US student has increased over 50 percent in constant-year dollars.[xxvii] Although individual student performance has improved during this period of increased spending, performance has not kept pace with spending. Higher labor costs are responsible for one-half of the increased expenditures.[xxviii]

Not only has student performance not matched these cost increases, neither has industry productivity. According to some calculations, productivity in schools has decreased by 30 percent during the last 30 years.[xxix] One reason for the higher costs and lower productivity is that average teacher-to-student ratios have decreased from 23 in 1970 to 17 in 2002.[xxx] The ratio of output (number of students educated) to input (per unit of work by teachers) has decreased. In stark contrast, most US industries have enjoyed solid increases in productivity, primarily by exploiting information technology.

The education industry has not yet been able to exploit information technology in a way that significantly decreases costs or improves student achievement, although there

are signs that progress is being made.[xxxi] Published data and observations made by seminar members during field trips suggest that information technology, though widely present, is not systematically well integrated as part of the K-12 curriculum. However, secondary schools commonly make computers and Internet access readily available for familiarization, research, and knowledge sharing, and a variety of collaborative initiatives exist at the national level to assist educators in leveraging technology in cost-effective ways. Information technology and "electronic learning" (e-learning) are discussed further in an essay on page 15.

CHALLENGES:

The education industry faces several challenges. Some have existed for many years, while others are relatively new. The need to overcome them, however, is greater than ever because of globalization's explosive economic competition, the rapid race to stay at the forefront of advancing technologies, and the emerging demographic shifts in the US. Moreover, whereas these challenges have merely represented obstacles or socioeconomic nuances in the past, they now have clear national security implications. The most important challenges are poor achievement among minority students, low teacher retention, powerful teacher unions, shortages of graduates with advanced science and math skills, and school-choice issues.

Poor achievement among minority students is the most publicized and among the most important challenges. Educators and government officials who champion the need to improve minority student achievement often do so by pointing to the need for equity among the entire population and by recognizing that poor education is largely responsible for social ills such as poverty and crime. There is another reason, however, that makes this challenge even more worth confronting: the percentage of Hispanics and African Americans making up the US population is increasing.[xxxii] As a result, these groups are playing a growing role within America's economy and national security, whether it is through their economic participation in the US workforce or through their direct service in the US Armed Services. The need for these groups to improve cannot be overstated.

The US government is currently addressing this challenge through the No Child Left Behind Act of 2001. This law pushes states to monitor, assess, and report the performance of virtually every student; to hold the schools and their leaders accountable; and to take action to raise the achievement of those students who fall short of the learning standards. With an undertaking of this size, it is not surprising that parts of the education industry have not fully embraced this initiative.[xxxiii] The challenge is to stay focused on the end goal, make reasonable adjustments to the law when necessary, and identify further actions that will raise the level of traditionally low-performing students. An essay on page 18 further describes the importance of learning standards.

Another key challenge is low teacher retention. Nearly 25 percent of new teachers leave the vocation within two years, and 40 percent of new teachers leave within five years.[xxxiv] Factors contributing to teacher turnover include: poor compensation, poor administrative support, lack of influence on decisions affecting classrooms and schools, and teacher preparation issues.[xxxv] These factors need to be addressed in a way that does not generate new challenges for the industry. For example, teacher pay could be increased significantly, but overall costs might reach unsustainable levels. The teacher retention issue is described further in an essay on page 12.

While increasing the retention of high-quality teachers is key, so too is improving the relationship between teacher unions and school officials. Teacher unions represent nearly 80 percent of K-12 public school teachers and wield an enormous amount of influence at the local, state, and federal levels.[xxxvi] Their primary tools of power are collective bargaining and political influence. Through collective bargaining in nearly 40 states, the unions work to gain the best terms of employment for the teachers. In doing so, they have increased teacher pay and benefits, decreased teacher workload, and established employment protection measures for all teachers, including low performers.[xxxvii] Although these efforts may serve the needs of the teachers, published studies show teacher unions collectively have increased the costs of education without improving overall student performance.[xxxviii] The unions are also very active in steering policies on nearly every issue facing a school district, and they have spent extremely large sums of money to affect elections, principally to elect officials who share union views.[xxxix] Their participation in politics and their success in inhibiting school districts from implementing reform initiatives have placed them in a divisive role.[xl] Finally, teacher unions have not only protected lower-performing teachers, but they have also prevented schools from offering merit pay and other incentives to attract the best and brightest, including those who could teach critical subjects such as science and math.[xli]

By 2008, the US will need over two million new highly skilled technology workers with solid science and math skills.[xlii] The National Science and Technology Council has expressed concern about the nation's ability to meet its technical workforce needs and to maintain its science and technology strength among international competitors.[xliii] If US science and math achievement does not keep pace with other countries, America is unlikely to maintain competitive advantage in the rapidly advancing technology arena. By ages 11 to 14, the majority of students believe that math, science, and technology are "boring and unglamorous."[xliv] To ensure the US economy and technology-driven military remain preeminent, more students must be motivated to gain advanced science and math skills, and more qualified instructors must be available. The US will need more than 240,000 new K-12 science and math teachers to meet the anticipated demand for scientists and engineers over the next decade.[xlv]

The final key challenge involves the issue of school-choice—giving students a choice of where to attend school. It is clear that students who struggle when attending a traditional school can flourish in a different environment—seminar members observed this first-hand during field trips to charter and magnet schools. The challenge is to allow students an opportunity to move out of schools that do not meet their needs and into successful schools that do, all without disturbing the quality of the overall school system.

Critics of school-choice initiatives such as voucher programs believe that giving students the option of leaving lower-performing schools will only make those schools worse for those who are left behind and cannot, for whatever reason, take advantage of this option.[xlvi] Proponents believe school-choice is a right that will allow individuals to perform better once they have moved to a school of their choosing. Proponents also claim that the competition generated by school-choice programs will prompt the lower-performing schools to improve.[xlvii] School-choice may also provide gifted students the opportunity to reach their full potential for high achievement. It is too early to conclude whether existing school-choice programs help or hurt the overall education industry.

As a final note regarding these and other challenges, it became apparent during the seminar's domestic and international field visits that school principals play an especially important role in turning challenges into successes. It is no surprise, of course, that strong leadership yields success, but it is particularly true in schools. An essay on page 20 describes the importance of school principals being leaders rather than just administrators.

OUTLOOK:

The education industry is well positioned to satisfy the near-term needs of the US National Security Strategy. However, elected officials and taxpayers must choose to invest in a long-term commitment to the US education industry to guarantee sustained improvements. The ability of the industry to strengthen the economic, military, diplomatic, and informational instruments of power will be a function of not only how much funding is provided, but also of how the nation approaches the challenges described previously. The industry must apply its resources judiciously for success. Implementing sustained change to the national education system will require facing and overcoming several obstacles.

In the next five years, the implementation of the No Child Left Behind Act of 2001 drives the education industry's outlook. This federal government cornerstone education activity can improve academic achievement and raise the performance of minorities. Based on the progress of many states, and in light of the federal government's willingness to adjust the law, the outlook is cautiously encouraging. Overall student performance and low-performing minority student achievement should improve because of the increased attention given all students. However, as teachers and students concentrate on passing their states' respective standards of learning tests, care must be taken not to focus on test-taking rather than on overall knowledge-building.

Beyond five years, the federal government desires the industry to undergo a cultural conversion. US Secretary of Education Paige stated, "Our vision is to change the culture of education, from a culture of compliance and susceptibility to instructional fads to a culture of achievement, professionalism and results."[xlviii] Realizing this ambitious vision will require significant cultural change featuring tenacity and ground-level support over many years. Sustaining this change will be a function of two short-term factors: the success of the No Child Left Behind Act in improving all students' performance, and political will.

Political and social factors will continue to influence the education industry. Republicans and Democrats will approach the issues of education differently, and those who control the governors' mansions, state legislatures, White House, and Congress will set policies that define the industry's long-term outlook. Local and state politics will largely determine funding levels. As the nation's demographics move toward a majority of minorities, a shift in national resource priorities must occur as congressional representation changes and resources are allocated accordingly.

Whether the US education industry holds a globally preeminent position is difficult to determine with certainty. Education provides a public good to a US marketplace that flourishes. Moreover, America's superpower status may suggest the US education industry is preeminent. Conversely, limited international testing data points to an American system that might be lagging. Secretary Paige recently stated that the US

"remains mired in internal education politics and mediocrity, while other countries are moving ahead by putting their focus squarely on achievement."[xlix]

Consistent with this assessment, the US continues to increase spending on solving education shortfalls. The federal government has developed new policies and budgeted $3 billion in response to teacher retention problems.[l] State and local education officials, boards, departments, and councils also recognize the teacher recruiting and retention challenge. In response, some states and localities have implemented creative and affordable programs to retain teachers and make those teachers more effective. While many efforts are underway to solve this problem, the uneven nation-wide response illustrates the education industry's decentralized nature.

Teacher unions are a powerful force and have thus far been reluctant to embrace the changes many see as crucial to reformation of the education industry. The extent to which these actions have collectively helped or hurt student learning is not completely certain, but it appears student learning has not improved in concert with union-driven cost increases. To remain viable in the long-term, teacher unions will likely move toward more professionally oriented objectives such as teacher development and curriculum standardization. In the near-term, teacher unions will undoubtedly begin to give approval for performance-based pay and likewise allow merit pay and other incentives to attract and retain teachers with high-demand skills such as science and math.

Science and math skills will, at least in the near-term, remain in short supply if specific action is not aimed at the shortage, but some progress is likely. Businesses will likely expand incentives to students who excel or enroll in math and science classes. Incentives, though locally managed, will need to be developed nationwide for the US to make significant progress. Collaboration to address the shortage will occur by virtue of the increases in information technology. In the long-term, market forces (employment opportunities, compensation levels, etc.) are likely to have a measurable positive effect on reducing the shortage of graduates with necessary technical skills.

School choice initiatives will likely improve student achievement in the near-term. School vouchers, which have been in existence since the early 1990s, increase the opportunities for middle- and low-income students to choose to attend a public or private (including parochial) school at public expense. The No Child Left Behind Act increases the opportunities for students to exercise their right to choose among public schools. Between these increases and the maturation of relatively new charter schools and magnet schools, school choice should become less controversial and more streamlined.

The federal government, as a guarantor of equal access to education and as a catalyst for improvement, will steer the education industry. The industry will respond by providing incentives to teachers, enlisting union support, improving math and science skills, and allowing students and parents a choice in their educational institution. The net results will enable the development of a well-educated labor force that will ensure the US retains its preeminent position as the leader in the free world.

GOVERNMENT GOALS AND ROLE:

> *The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people. – Tenth Amendment to the US Constitution*[li]

The United States Constitution does not assign the federal government any authority regarding education. Therefore, according to the Tenth Amendment, states and local communities have responsibility for education. There is perhaps no other function in America that has such clear *national* security implications without *federal* government authority. Thus, two fundamental questions emerge as to whether the Constitution should be amended to allow an authoritative federal role or whether the federal government can carve out additional roles for itself within the construct of the Constitution.

Considering the deep-seated roots of education at the state and local levels, and because the current decentralized framework has well served US national security, state and local governments should retain their current primary responsibility and authority over education. During seminar visits in England and Germany where the education systems are more centrally controlled, education officials stated that more flexibility was needed at the local level. In some cases, they have partially migrated to a less-centralized system, mirroring the US framework. Thus, with US states and localities retaining the greatest role, the appropriate US federal role should be to: lead the national discussion on achieving academic excellence, particularly in those subjects that have clear ties to national security; assist the states in overcoming obstacles; and ensure all citizens have equitable *access* to high quality education while targeting low-performing demographic groups for improvements.

Consistent with this view, the US Department of Education's current mission is "to ensure equal access to education and to promote educational excellence throughout the nation."[lii] The department's goals are appropriate and on target: create a culture of achievement by effectively implementing the No Child Left Behind Act and by basing all education programs on its principles; improve achievement for all students by putting reading first, expanding high quality mathematics and science teaching, reforming high schools, and boosting teacher and principal quality; and establish safe, disciplined, and drug-free environments that foster the development of good character and citizenship.[liii]

Policy Recommendations

The following recommended federal policies address the challenges identified in this paper and strengthen the education industry's contribution to national security:

- Firmly maintain the current course in implementing the No Child Left Behind Act
- Initiate a national campaign entitled, "Evolving 21st Century Teachers—A National Campaign to Transform the Teaching Profession"
- Establish a national challenge that raises the profile of science and math studies
- Assume direct responsibility for operating the District of Columbia school district

The federal government's current implementation of the No Child Left Behind Act should remain on its current course despite the reticence of a few states. The Act is well principled, reasonable in its mandates to the states, and has direct ties to US national security, especially given the changing demographics of the country.

A proposed national campaign, entitled, "Evolving 21st Century Teachers—A National Campaign to Transform the Teaching Profession" would focus national efforts on teacher salaries, working conditions, preparedness, and school leadership. Initiatives that exist to address these problems lack a unifying national vision. The campaign would

bring together representatives from across the teaching profession—teachers, teacher unions, principals, post-secondary institutions, federal, state and local governments, and national organizations. The campaign must include a significant public relations element to create a new teaching profession characterized by: well-respected, well-compensated, quality teachers in every classroom; continuous leadership focus on teacher professional development; and high teacher retention. The campaign would integrate the efforts of public and private groups, leveraging the influence and experience of teacher unions and their professed desire to improve the quality of teachers. The campaign would promote teaching as an admirable and inspirational profession.

A proposed federal initiative to raise the profile of science and math studies should be highlighted by a challenge to the nation—one that motivates students and teachers to study the sciences and related fields. Several programs exist that serve this same goal, but they lack national relevance or widespread enthusiasm like that of the challenge to go to the moon in the 1960s. Potential initiatives include developing cost-effective energy sources to avert energy crises, or eradicating diseases and discovering cures to cancer and heart disease. Though these and other efforts are already in progress and enjoy significant funding, they lack the spark of widespread enthusiasm. Thus, the primary mechanism of this federal initiative would be through a sustained public relations campaign with an end goal of winning renewed national interest in the sciences.

Finally, perhaps the boldest of these recommendations is for the federal government to assume direct responsibility to operate the District of Columbia school system. The federal government already operates one school system—the Department of Defense Schools. Unlike that system, the District of Columbia school system has been, on the whole, failing for several years.[liv] Federal government intervention, executed through the US Department of Education, presents an incredible opportunity to establish a national model of excellence for inner-city education and demonstrate the federal government's commitment to education. In addition to the current District of Columbia school system budget, which includes more funding per student than any other big city in America,[lv] additional funding is currently available to pay for this initiative. A portion of the unspent No Child Left Behind funds (over $1.9 billion from the last two years[lvi]) could be used in this effort. The money is available—what is needed is an organizational overhaul, an integration of best practices from across the country, and an application of the principles espoused in the No Child Left Behind Act.

ESSAYS ON MAJOR ISSUES:

LOW TEACHER RETENTION—CAUSES AND SOLUTIONS

Public school teacher attrition appears to be chronic and at crisis levels. The solution to this apparent crisis seems obvious—recruit new teachers or retain current teachers, or both. Affording this solution makes the choice more complex. Education decision makers at all levels can substantially resolve this teacher shortage crisis by focusing on retaining and developing highly qualified public school teachers through achievable, affordable, and proven programs.

This essay argues that the key to resolving the public school teacher shortages lies with a long-term and comprehensive effort to address the issues that cause teachers to

leave the profession. The essay begins by briefly discussing the background concerning the teacher shortage and then describes a variety of promising approaches and strategies for improving the retention of highly qualified teachers. Policy options are offered to enable the resourcing, coordination, and implementation of teacher retention strategies.

BACKGROUND

Industry experts agree that a shortage of public school teachers exists, but they disagree on the cause. Some claim that student enrollments have outstripped the available supply of new teachers and that this gap will continue to grow with an unmet demand of over 200,000 new teachers per year during the next decade. They cite poor pay relative to other professions and normal retirements as among the factors that have kept the new teacher supply low. Employment opportunities in other fields for skilled young people make teaching a less attractive choice.[lvii] The teacher workforce is aging; the average age of a public school teacher increased from 37 years in 1981 to 46 years in 2001.[lviii] Many career teachers, hired in the 1970s, are retiring from the profession.

An increasingly large number of experts have begun to assert that attrition of new teachers lies at the core of this shortage. The number of available new teachers has increased dramatically since 1987.[lix] The supply of potential teachers nation-wide exceeds the demand for teachers by 100 percent with estimates of nearly 3 million more people trained to teach than are actually teaching.[lx] However, reports indicate that 25 percent of new teachers leave teaching within two years and 40 percent or more are gone within five years.[lxi] In 2000, teachers leaving the industry exceeded new entrants by 23 percent, a major reversal in attrition rates from 15 years before.[lxii] Retirements accounted for some attrition, but teachers leaving the profession for other reasons outnumber teacher retirements by a three-to-one margin.[lxiii] Simply stated, teacher attrition is the major factor contributing to the shortage of public school teachers.

THE HEART OF ATTRITION—WHAT CAUSES TEACHERS TO LEAVE?

Studies and surveys identify a variety of factors that contribute to teacher turnover. Not surprisingly, poor compensation highlights nearly every study and survey.[lxiv] While teachers universally cite salary as a key factor, a large number of factors related to work environment suggest a more significant trend. These environmental factors indicate problems within the schools and districts vice issues associated with governmental policies. Poor administrative support from principals and staff accounts for dissatisfaction levels for 25-50 percent of survey respondents.[lxv] Faculty interaction issues account for another set of major environmental factors. Some surveys cite the impact of fellow teachers and feelings of isolation among new teachers.[lxvi] Others note concerns for lack of faculty influence on decisions affecting the classroom and the school.[lxvii] Teacher preparation issues categorize a final major trend among surveyed teachers. Within this category, surveys indicate concerns about available time to prepare lessons, lack of resources for adequate classroom instruction, and feelings of lack of either content or process knowledge and expertise.[lxviii] These environmental factors all relate to the social conditions within the schools. These survey trends reveal a number of possible approaches to addressing teacher attrition.

DISCUSSION—NATIONAL INITIATIVES AND PROMISING APPROACHES.

The teacher retention problem has drawn recent attention at all levels of education, from the federal government to the individual school principal. At the federal level, the Bush Administration recognized the continuing challenge of recruiting and retaining high quality teachers and took action in 2001 by championing the No Child Left Behind Act.[lxix] Local and state education officials, boards, departments, and councils recognize this same recruiting and retention challenge.

Much of the recent media attention regarding teachers has focused on those provisions of the law that require highly qualified teachers in every classroom by the end of the 2005-2006 school year. The law encourages states and localities to develop innovative programs for improving teacher quality, which leads to greater retention. This encouragement specifically includes federal funding of nearly $3 billion earmarked for efforts that focus on teacher quality and retention.[lxx]

Federal government policies and resources address the factors that contribute to teacher attrition. By providing funds and strategies related to teacher compensation, the No Child Left Behind Act supports improvements in teacher salaries. By focusing on professional development, leadership, principal quality, and workplace issues, these federal strategies attend to some of the factors cited in studies as contributing to attrition. However, with federal programs contributing only 10 percent of the total spent on public education,[lxxi] public education remains the domain of states and localities.

A philosophy of strong local control dominates the education industry. That philosophy translates to a desire by local decision-makers to encourage creative, low-cost approaches to improving teacher retention. In a search for solutions that are both realistic and acceptable, three approaches emerge: mentorship programs, professional development programs, and principals as leaders.

Mentorship programs receive frequent attention as being very effective in retaining new teachers and expanding the quality of the teacher workforce in schools. Surveyed teachers detail effective mentoring techniques that include daily interaction between the teacher and mentor, formal mentoring teams, and willing, non-judgmental mentors. Even informal mentorship efforts such as teacher support groups and parental support to new teachers makes a difference in the eyes of teachers.[lxxii]

Professional development programs can provide new teachers with structured training that dramatically reduces the likelihood of attrition. Coupled with practice teaching sessions and effective and immediate teaching feedback sessions, this type of early professional development opportunity clearly results in teachers that feel better prepared to teach, a key feature in retaining new teachers.[lxxiii]

Principals as leaders in the school can serve as the agents for change in teacher attrition.[lxxiv] Principals who invest time and resources into mentorship and professional development programs will spend less time and energy on teacher recruiting and hiring.

While most of these approaches require little money, most school districts operate with little discretionary funding. Support from state and federal governments (as illustrated by the $3 billion available in the fiscal year 2003 Department of Education budget) can assist schools and districts with establishing and reinforcing these initiatives.

RECOMMENDATIONS AND CONCLUSIONS

The efforts of the Bush Administration to re-vitalize the nation's education system set the stage for a new relationship between the federal government and the states. Department of Education initiatives that focus on teacher retention correspond to the approaches proposed by industry experts and implemented by local and state educators unevenly across the country. These teacher retention strategies—illustrated by mentorship programs, principal leadership, and professional development—are proving effective in stemming the teacher retention problem. The decentralized nature of public education inhibits the uniform implementation of these strategies throughout the US.

The national political leadership should continue to support and expand federally sponsored programs that address teacher retention. The two largest teacher unions, the American Federation of Teachers and the National Education Association, along with organizations such as the National Council for Teacher Accreditation must lead efforts to coordinate national implementation of teacher retention programs. Working with post-secondary education systems, these organizations should support the development of teacher education programs that improve new teachers' indoctrination into school cultures and systems.

Teacher attrition remains a chronic issue faced by all levels of public education. Fortunately, promising solutions exist and have both the funding and philosophical support of national leaders, experts in the field, and innovative local and state educators. Continuing and broadening the implementation of teacher retention strategies can address the widespread problem of teacher attrition in affordable, realistic, and innovative ways.

Essay by LTC(P) Patrick Sharon

APPLYING INFORMATION TECHNOLOGY AND E-EDUCATION TO IMPROVE TEACHER QUALITY

Information technology offers the education industry an opportunity to make sweeping changes. Progress is being made along many avenues, particularly in post-secondary education, but the industry lags well behind other industries in terms of exploiting information technology to reduce costs, improve efficiencies, and improve product quality.

The education industry should move forward first by smartly allocating information technology, knowledge management, and leadership training resources toward improving teacher quality. Once teacher quality is improved and teaching methods that better use information technology are developed, higher student learning and achievement will result.

The two initial foci for allocating resources ought to be in providing distance "electronic education" (e-education) for teachers and in fostering online "communities of practice" for teachers to exchange ideas, best practices, etc. Once these initial efforts are in place, additional applications for using e-education can be implemented. Information technology and processes play a key role in this strategy. K-12 educators would do well to leverage the on-going efforts in post-secondary institutions.

WHAT IS E-EDUCATION?

E-education is commonly defined as a system that provides students with learning materials in electronic form, teaches and supports students online, and provides online administrative services such as enrollment, billing, information, and advice.[lxxv]

This system represents an extremely high growth sector within the education industry and has great potential for future market expansion. A Department of Education report found that 1,190 distance learning programs were offered by higher education institutions in 1998, a 72 percent increase from 1995. In 1998, 1,680 institutions offered a total of 54,000 online-education courses, with 1.6 million students enrolled.[lxxvi] Furthermore, a recent report by Eduventures, Incorporated stated that the online distance-learning market grew more than 50 percent in 2002 to reach $3.7 billion and will maintain growth rates in excess of 30 percent for a number of years to come.[lxxvii]

In 2000-2001, the number of two-year and four-year degree-granting institutions in the US was 4,130. Of those, 2,320 offered over 127,000 distance courses, and about 700 institutions offered an undergraduate or graduate degree totally online.[lxxviii]

Today, the leading institution for e-education, the University of Phoenix, has an enrollment of 120,000 students, making it the largest university in the world based on enrollment.[lxxix] There appears to be nearly limitless potential for growth in e-education.

GOVERNMENT SPONSORSHIP

The federal government and several state governments are actively involved in promoting electronic learning. Through initiatives such as the Distance Education Demonstration Program, Distance Learning for Teachers, and the Learning Anytime Anywhere Partnerships, the Department of Education is taking a pro-active approach.[lxxx] The National Science Foundation sponsors the "Tapped In" website, a "community of practice" for educators.[lxxxi]

WHAT IS BEING OFFERED AND WHO OFFERS IT?

E-education offerings cover the entire spectrum of education and training. The list of states that have e-education initiatives for their K-12 students is growing. For example, as part of its Kentucky Virtual High School initiative, the Kentucky Department of Education offers the full spectrum of English, math, science, language, and social studies courses, as well as 19 Advanced Placement courses, online.[lxxxii]

Countless colleges and universities offer online courses and degrees. From those prominently associated with online education, such as University of Phoenix and Capella University for which the majority of business is online, to hallowed institutions like Harvard University and Stanford University that offer individual courses online without offering degrees, the choices abound.

Masters and doctoral degrees may also be earned online. The University of Phoenix and Capella University offer doctoral degrees in the education and business disciplines, while traditionally "on campus" schools like University of Florida and Boston University offer online doctoral degrees in Pharmacy and a Doctor of Physical Therapy, respectively. Pepperdine University offers doctoral degrees partially online.

Formal corporate education is a big user of online resources. General Motors University, tasked with developing corporate leadership, provides managers with around-the-clock access to online coursework designed and prepared by Harvard University.[lxxxiii]

Finally, there are several schools offering completely online teacher credential programs, including National University in San Diego, California.

COST OF E-EDUCATION

On the whole, e-education is on par with "on campus" education regarding tuition, fees, and other costs. Seventy-seven percent of institutions charged the same tuition for similar online and traditional courses, and 66 percent did not charge additional fees for distance education classes.[lxxxiv] By using a strategy of relatively low technology media, the cost of developing and maintaining coursework can be minimized. A second-order effect of this approach is that as corporations and government agencies purchase new technology, they may donate older equipment to K-12 schools for e-education. A great deal of learning can occur with minimal technology.

WHY TARGET TEACHERS?

The theory of "expertise" has direct bearing and applicability on the policy recommendation that follows.[lxxxv] There are six key principles of this theory:

1. Experts notice features and meaningful patterns of information that are not noticed by novices.
2. Experts have acquired a great deal of content knowledge that is organized in ways that reflect a deep understanding of their subject matter.
3. Experts' knowledge cannot be reduced to sets of isolated facts or propositions but, instead, is conditional on a set of circumstances.
4. Experts are able to retrieve important aspects of knowledge with little effort.
5. Though experts know their disciplines thoroughly, this does not guarantee that they are able to teach others.
6. Experts have varying levels of flexibility in their approach to new situations.

Two factors contribute to becoming an "expert": talent and time.[lxxxvi] Teachers are the best first targets because they, compared to students, are "expert" learners.

COMMUNITIES OF PRACTICE CONCEPT

Workplace communities of practice are small groups of people held together by "a common sense of purpose and a real need to know what each other knows."[lxxxvii] Learning is viewed as a social activity that occurs as newcomers and journeyman move through an established community's professional hierarchy toward expertise.[lxxxviii] These groups offer "shared experiences", and the importance of these experiences is a major theme from studies of teacher collaboration.[lxxxix]

POLICY RECOMMENDATIONS:

More highly qualified teachers are needed to increase learning and achievement among students. Teachers need to develop both content and pedagogical knowledge to become experts. Of course, teachers are key to enhancing learning in schools—in order to teach in a manner consistent with new theories of learning, extensive learning opportunities for teachers are required.[xc]

The best ways to provide such opportunities are through continuing education of teachers through e-education and the development of affordable (i.e. low-end technology) online communities of practice.

Once progress is made in this area, other aspects of the education industry can be enriched. Potential applications of e-education include:

- Enriching education opportunities for students who do not have access to quality teachers or facilities.
- E-education offerings in inner city and rural areas that lack "specialty" teachers in subjects such as physics, advanced mathematics, special linguistics, etc.
- Virtual facilities (science labs, etc.)
- Home-schooled, special needs, and working students
- Teenagers isolated from the mainstream due to discipline/social considerations
- Advanced education and communities of practice for education administrators

Essay by CDR George Fadok

LEARNING STANDARDS AND THE NO CHILD LEFT BEHIND ACT

Reports of poor student achievement coupled with the pressure of the learning standards movement have escalated to the point that the public has become concerned, if not alarmed. There is demand for action, but has the current federal education policy positioned the country for success or simply burdened the schools with bureaucracy? This essay addresses that question through an examination of how standards will lead to improvement in the US school system.

Standards define what students must know and be able to do and include what knowledge and skills are required to meet the learning goals. Implementing standards, as a way of measuring achievement and holding schools responsible for student learning, is the cornerstone of President Bush's education policy. Improving the American public school system so that all students can be successful learners starts with establishing goals, standards, and accountability systems.[xci] National education goals were established in the early 1990s. The No Child Left Behind Act of 2001 (NCLB) addresses the need for standards and accountability.

NCLB is geared towards children in grades 3-8 with an impetus on passing standardized tests in reading and math (science will be added in 2006-07). For fiscal year 2004, over $14 billion in funds are targeted to support needy public schools, *Reading First* and *Early Reading First* programs, charter school grants, and the new School Choice Incentive Fund. Over $12 billion in Pell grants will provide opportunities for low-income students to attend college. Yet, questions about NCLB have arisen regarding: lack of public information, lack of clear definition for "Adequate Yearly Progress", lack of definition for "Highly Qualified Teacher," stringent and restrictive requirements, limited federal funding, too much federal government involvement, conflicting guidance, and too little time to focus on social skills.

The 35th annual Phi Delta Kappa/Gallup poll shows that the public has high regard for the public schools, but is uninformed about NCLB.[xcii] The public supports higher pay for teachers and prefers to support their local school rather than take their children elsewhere. There are misconceptions about why achievement gaps exist among racial groups, and parents tend to blame other factors rather than the schools, which they consider under-funded. Clearly, the public needs to be better educated as to what current

research has shown about learning, what to expect from NCLB, and the processes in place in their local district to affect improvement.

Due to the US Constitution and national values, school reform dictated from the national level is unlikely; true reform will require each school fixing itself from within. In his book about reinventing the public schools, W. E. Nothdurft states:

> "Workforce competence cannot be micro-managed at the national level … states and localities need a unified and unifying vision—a national declaration of purpose—based upon proven principles and backed by sufficient resources to turn that vision into successful, locally appropriate realities."[xciii]

Although the real work has to occur at the local and state levels, the support and insistence on standards from the national level will move the country towards a more unified approach to educating all students. Standards will help define the mission and set the bar for achievement. Money for teacher professional development is available, yet the schools need help recruiting and preparing teachers for the classroom. There needs to be a process of evaluating classroom performance based on qualities of a good teacher, with training and incentives for excellence.

Consistency, coherence, and capacity are key elements of standards-based reform.[xciv] Consistency is achieved when, regardless of a change in leadership, a long-term plan for improvement is followed, one that builds upon previous agendas and involves taxpayers, educators, policymakers, and business leaders working together. Coherence occurs when standards are defined first, aligned with the curriculum, and assessed accordingly. Capacity to meet high standards requires professional development opportunities for teachers to master both content knowledge and pedagogical skills. It also means that disadvantaged students and schools will need additional resources. More attention to equity issues and research to determine how subgroups are being affected by NCLB is imperative to prove its worth. A consistent, coherent approach based on increased capacity to meet identified needs must be developed. Moreover, public school leaders need a blueprint on how to address common and recurring challenges.[xcv]

According to the Council of Great City Schools, test results from 2003 show fourth grade students improved five percent in reading and seven percent in math, while eighth-graders showed slight improvement of one percent in reading and three percent in math.[xcvi] These numbers are not astounding, but they indicate progress. The movement to set national goals and standards in education must continue. National testing allows for valid comparisons between schools, districts, and states. Testing provides a valuable means by which American students are compared to students in other countries. However, national tests would be more cost effective and efficient if states would be relieved of bearing the costs of this administrative requirement. Rather than an attempt to take power from the states, standards requirements and the associated efforts are part of a consolidated effort to rebuild and reform the education system.

The US must stay the present course until NCLB brings the reform America is clamoring for or until it is superceded by a new policy. This law puts the focus on principals and superintendents and forces all responsible to give attention and assistance to failing schools. It puts pressure on the states and local authorities to provide additional

assistance to minority students and allocate funds to fix the failing schools. Leaders at every level must approach this law with an open mind if it is to have any chance for success. Shared standards between states will create unity of effort toward placing America as the undisputed world leader in education.

Essay by Ms. Karen Carleton and COL Ralph Butler

K-12 SCHOOL PRINCIPALS AS STRATEGIC LEADERS IN THE 21st CENTURY

During the seminar's field trips in the US, England, and Germany, a common thread was observed at thriving schools—strong strategic leadership in the principal or headmaster position seemed to overcome and, in many cases, eliminate the challenges discussed in this report. A dynamic leadership team of administrators, teachers, parents, and students driven by a principal who mentored and motivated them led high achieving schools. Such dynamic leadership teams created a climate that may, in fact, have been representative of a culture wherein school pride exuded from students and teachers alike. This resulting culture was closely linked to a shared sense of community and to the importance of learning. Strong leadership, though often directly connected to success in business and the military, is not as commonly associated with success in education. In fact, seminar members observed that leadership matters very much.

Fortunately, research exists to support such observations. As schools transform in response to various pressures including complaints on education quality, market demands for more skilled workers, rapid technology advances, and school choice, the principal's role in leadership for learning cannot be overstated.[xcvii] However, the principal is generally considered to be "… a middle management position overloaded with responsibilities for basic building operations" and generally fails to hit the mark where the role of the principal as a strategic leader is critical.[xcviii] Principals must not only know academic content and pedagogical techniques. They must also help teachers develop their skills; they must collect, analyze and apply data to help fuel excellence; and they must "rally students, teachers, parents, local businesses, and other community residents and partners around a common goal of raising student performance."[xcix]

Published research indicates that principals provide a significant effect on student achievement.[c] The research identifies several trends whereby principal leadership impacted student learning outcomes, including school goals, school structure, social networks, and organizational culture.[ci] Furthermore, the primary means of principal influence was to shape the school's direction through vision, mission, and goals.[cii]

Published studies also point out that a school's culture can have more influence on schoolhouse learning than the president of the country, the state department of education, the superintendent, the school board, or sometimes even the principal, teachers, and parents.[ciii] This supports seminar observations and explains why principals in thriving schools intentionally played a large guiding role in shaping a school's culture.

To create thriving schools in the Information Age, the role of the principal must transform from that of an administrator/manager to one as a strategic educational leader, which demands the following critical competencies of a principal committed to students and teachers and accountable for academic success:[civ]

1. Define and effectively communicate the school's mission, vision, and goals supporting high performance expectations.

2. Develop people, including: "providing intellectual stimulation, offering individualized support, and modeling desirable professional practices and values," and fostering knowledge sharing.[cv] This includes providing instructional guidance through the use of professional standards and their use regarding continuing professional development and personnel evaluation.[cvi]

3. Align the organization to foster a collaborative school culture, productive community relationships with stakeholder participation in school decisions, and inspire school pride based on educational accomplishment.

4. Mentor and motivate teachers with proper support and training.

5. Mentor and motivate students.

6. Establish a climate and develop a culture where learning challenges are exciting and fun; shape teachers' sense that they are part of a professional community.[cvii]

7. Outreach to parents and to the community.

Principals and headmasters were observed during seminar field visits doing the very things on this list with amazing results. The best principals provided inspiring vision, built effective leadership teams, and spent an enormous amount of time developing, mentoring, and motivating their teachers to provide incredibly high levels of student academic performance. These principals welcomed change, embraced creativity and, in general, had fewer problems.

The seminar's recommendation to "Evolve 21st Century Teachers" might be one avenue to provide a natural professional progression to grow principals from the ranks of teachers, but is that enough? The development of strong strategic leadership skills in principals throughout the education system must be institutionalized because leadership matters so much in this industry. Though it may be more common to think strong strategic leadership matters more in business, sports, and the military, such leadership is desperately needed within the education industry.

Essay by Dr. Joseph Arcano and Lt Col Glenn Rousseau

SUMMARY ASSESSMENT OF OTHER SECTORS IN US EDUCATION INDUSTRY

Although K-12 represents the largest and most important part of the education industry, there are a host of successes and challenges outside of K-12. This essay offers brief summary assessments of the other key sectors within the industry.

Pre-school has become an accepted cultural norm in the US and is bolstered by federally assisted child development programs such as Head Start. Head Start, with an overall goal to increase the school readiness of young children in low-income families, currently has 909,000 participating members and an annual investment of $6.6 billion.[cviii]

Special Education within the K-12 sector has improved, based on test scores, due in part to an industry focus on integrating Special Education students with the rest of the student body to the extent possible. Special Education receives targeted federal funding and, in the last four years, has seen increases of $1.0 billion a year; the President's FY05 Budget requests $12.2 billion.[cix] There is a perpetual shortage in Special Education teachers, and part of this funding is earmarked to address that shortage.

Colleges and universities continue to experience explosive increases in costs. Average post-secondary education costs have risen at rates well above inflation every year since the 1980s.[cx] The average increase during the 2002-2003 school year was the highest in 30 years—9.8 percent.[cxi] Also concerning is the number of college students who do not complete their studies and earn degrees. Currently, over 50 percent of students who start college do not finish.[cxii] On a more positive note, public opinion research conducted by the Educational Testing Service gives American higher education a 72 percent approval rating from an aggregate adult survey population, a 73 percent approval rating from business executives, and an 89 percent approval rating from students and faculty.[cxiii]

Lifelong learning—the continued pursuit of education beyond the traditional school age—is generally healthy as measured by adult participation in community college, vocational, and on-line coursework. By age 25, 84 percent of adult Americans have achieved at least a high school diploma or equivalent, and 51 percent are engaged in post-secondary education.[cxiv]

Corporate education, such as the seminar witnessed at General Motors University and Raytheon Corporation, continues to thrive in an economic environment where employee education is viewed as valued-added to a company's competitive advantage. Three common areas of focus for corporate training and education are leadership development, technical training, and business-oriented courses.

Finally, the education textbook sector includes eight publishers that competed for $5.4 billion in K-12 sales and $2.7 billion in post-secondary sales during 2002.[cxv] Small profit margins are among the biggest challenges facing this very competitive sector.[cxvi]

Essay by CAPT Ken Ryan

CONCLUSION

The US education industry has met its national security responsibilities in the past and is well positioned to do so in the future. The challenges facing the industry are largely similar to those of the past, but there is now a greater need to overcome them. Globalization, rapidly advancing technologies, and shifting demographics in the US collectively create a strategic environment that makes the most important resource in America—every single person—a vital part of the national security equation. Moreover, this new environment makes it imperative that everyone receive a quality education.

Current K-12 trends show general improvement in student learning and graduation rates, and the system is generating a majority of students who are prepared to enter the labor market or attend higher education. The industry must adjust, however, to address the shortfalls that lead to those who are not successfully educated. The most important challenges facing the industry are poor achievement among minorities, low teacher retention, powerful teacher unions, shortages in graduates with advanced science and math skills, and school choice issues. None of these challenges are insurmountable.

The passage and aggressive enforcement of the No Child Left Behind Act is an important and effective federal action aimed at improving the achievement of all students, particularly minorities who are making up a growing percentage of the population. The federal government should likewise set its sights on addressing the shortage of teachers and on raising the status of school teaching in America. Also, a

campaign to spark renewed interest in science and math will help ensure the country stays at the pinnacle of advancing technology. Finally, a model of education excellence located in the nation's capital would serve as a beacon to the education industry and signal the importance of education to US national security.

"I regard the proper education of our youth as a matter of paramount importance to the welfare and security of the United States."—President Harry S. Truman[cxvii]

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