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Education: A Defense Industry in Transition

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**EDUCATION:
A DEFENSE INDUSTRY IN TRANSITION**

Abstract

In 1983, the National Commission on Excellence in Education's Report, A Nation at Risk: The Imperative for Education Reform, confirmed the public perception that something is wrong with the nation's education system. AMERICA 2000 with six national educational goals is President Bush's strategy to transform America's education system. Implementation of the plan will have a beneficial influence on Department of Defense recruiting and training. Recruiters will have a higher quality applicant pool. Training managers should see reduced attrition rates and more efficient use of training time. The military will feel the biggest impact when it transitions to a "train before buy" system. In "train before buy" the military satisfies its needs by recruiting fully trained individuals. This is essential in an era when a reduced force size dictates that all the services examine the ratio between training and operational requirements.

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EDUCATION: A DEFENSE INDUSTRY IN TRANSITION

Introduction

On April 25, 1983, David Pierpont Gardner, President-Elect of the University of California and Chairperson of the National Commission on Excellence in Education, made what he labeled "A Report to the Nation". The commission formed "as a result of the widespread public perception that something is seriously remiss in our education."¹ Their red-letter document, A Nation at Risk: The Imperative for Education Reform, is both a rallying cry and a bible for a country making a historic effort to transform its educational system.

A Nation at Risk focused America on its educational system and kindled a number of initiatives. President Bush released the most important of these initiatives, AMERICA 2000: An Education Strategy, in April, 1991. AMERICA 2000 is a long range plan that contains the national education strategy. That strategy is to produce immediate improvements in the school system while preparing citizens to meet the challenges of the 21st century.

What is the impact of these initiatives on military recruiting and training with the approach of the 21st century? As the military services move toward the year 2000 they forecast an escalating requirement for personnel who can deal with advancing technologies. Two reasons are driving this demand. First, with reduced military manpower needs there are fewer low skill jobs. New areas of concentration such as space, information systems, and avionics, skyrocketed the requirement for qualified workers with

high tech skills. Second, shrinking budgets force the military to retire older weapons systems that now require the highest mix of low to high skill jobs. An example is the high technology B-2 replacing the B-52.

The essential question is whether Department of Defense recruiting policies alone can meet the requirements for a quality force considering the improvements precipitated by AMERICA 2000. The second question is whether improving the input into the military training system (the recruit) alone guarantees that the current military training system can meet those future high technology demands.

This paper will analyze these issues. The objectives of this essay are fourfold and encompass the following:

1. A summary of the findings and recommendations in A Nation at Risk.
2. A thorough examination of the transformation of these recommendations into a national strategy and achievable goals through a series of presidential initiatives designed to lead America into the 21st Century.
3. A review of Department of Defense accessions in the light of a shrinking military and the available applicant pool.
4. A commentary on the potential adjustments in recruiting and training required to maintain the technological edge of the military.

A Nation at Risk

Secretary of Education, T.H. Bell, created the National Commission on Excellence in Education on August 26, 1981. He directed that within 18 months the Commission report to him. The Commission achieved that goal by making a report on April 25, 1983. Its findings confirmed that the public's perceptions were in fact a reality. It concluded that:

"Our Nation is at risk. Our once unchallenged preeminence in commerce, industry, science and technological innovation is being overtaken by competitors throughout the world....We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people."²

The Commission's sources, in addition to papers from experts on a diversity of educational issues, included students, business leaders, citizens, and representatives from professional and public groups. They testified at a series of public hearings, panel discussions, meetings, and a symposium.

Indicators of Risk

The Commission's first task, after digesting the data, was to assess the risk. They stated that risk as follows:

"History is not kind to idlers. The time is long past when America's destiny was assured simply by an abundance of natural resources and inexhaustible human enthusiasm, and by our relative isolation....America's position in the world may once have been reasonably secure with only a few exceptionally well-trained men and women. It is no longer."³

The Commission compiled a sizeable listing that documented the dimensions of this risk facing the Nation. They labeled them their "Indicators of Risk". Some of the examples are:

- On 19 academic tests Americans were never first or second (in comparison to other industrialized nations) and were last seven times.
- 23 million Americans are functionally illiterate.
- 13% of 17-year-olds are functionally illiterate.
- Average achievement on standardized tests by high school students is now lower than it was 26 years ago.
- Scholastic Aptitude Test (SAT) scores have declined steadily since 1963.
- The number of students demonstrating superior achievement on the SAT also declined.
- Science Achievement Scores of U.S. 17-year-olds have been on a decline since 1963.
- In the five year period from 1975 to 1980, remedial mathematics courses in public 4-year colleges increased by 72 per cent.
- Business and the military spend millions of dollars on remedial education programs in basic skills as reading, writing, spelling, and computation.⁴

What do these observations imply? In a modern world that is demanding an ever increasing knowledge of technology, the United States is not only failing to keep pace, but is actually losing ground. Educational researcher Paul Hurd succinctly defined the problem when he concluded, "We are raising a new generation of Americans that is scientifically and technologically illiterate."⁵ This ceaseless dwindling of the requisite skills for analysis and problem solving is being further compounded by an absolute necessity to emphasize the essential skills of reading and

mathematics for citizens who lack even the basic competence required for their daily lives.

Findings

What are the causes of this chilling decline in American education? According to the findings of The National Commission on Excellence in Education, they divide into the four categories of content, expectations, time, and teaching. Content is the curriculum. When the commission scrutinized the differences in curriculum between 1964-69 and 1976-81, they proposed that:

"Secondary school curricula have been homogenized, diluted, and diffused to the point that they no longer have a central purpose....This curricular smorgasbord, combined with extensive student choice, explains a great deal where we find ourselves today."⁶

With the abandonment of the traditional vocational and college preparation track programs, students in both tracks are moving in the direction of a less rigorous studies program. A lack of mastery (depth) in specific course areas such as mathematics, science, foreign languages, and writing characterize this program.

The Commission defined expectations "in terms of the level of knowledge, abilities, and skills school and college graduates should possess."⁷ Measures of these expectations are grades, graduation requirements, examinations, admission standards, and the difficulty of the subject matter. The conspicuous weaknesses in the American education system include a lack of homework, inflated grading, few requirements, inadequate time on science and math, no minimum competency exams, and a depreciation in the selectivity of colleges and universities.

The findings concerning time focused on two distinct domains. First, is the amount of time actually spent in school. Americans spend fewer hours in school, and fewer days in school per year, than most all the other industrialized nations. Second, is the effectiveness of the time used in the classroom. For example, in some states drivers' education can count towards graduation.

Teachers are the cornerstone of the final area of findings. The Commission concluded that the teaching career field doesn't attract the best students. It notes "too many teachers are being drawn from the bottom quarter of graduating high school and college students."⁸ The Commission observed that the teacher curriculum at colleges and universities emphasizes instructional theory at the expense of subject matter expertise. Lastly, the working conditions of teachers is precipitating a teacher shortage characterized by a high turnover of teachers.

Recommendations

The National Commission on Excellence in Education made five recommendations to the Secretary of Education. In their introduction to the segment delineating the recommendations, they espoused the obvious when they stated "The topics are familiar; there is little mystery about what needs to be done."⁹ Their recommendations are:

Recommendation A: That high schools strengthen graduation requirements including minimum standards in core subjects.

Recommendation B: That all schools adopt measurable standards and that colleges boost their entrance requirements.

Recommendation C: That schools must use the school day more effectively and increase the length of the school day and the school year.

Recommendation D: That colleges and universities improve teacher selection, preparation, and working conditions.

Recommendation E: That the nation must hold educators and elected officials accountable.

America 2000

The challenges defined in A Nation at Risk do not chart a future course for effective action. President Reagan first faced the concerns identified in the report. In his State of the Union address on January 27, 1987, he declared, "The quest for excellence into the twentieth century begins in the schoolroom, but we must go next to the workplace." President Reagan clearly established his belief that education is a means to an end. That end is production of a workforce with the necessary skills to meet the needs of industry and business. This includes the worker's ability to adapt (retrain) if necessary in the face of a rapidly changing workplace.

Three reports are the foundation of the presidential initiatives that are leading the nation in its effort to strengthen the American educational system. These documents merit review since they are the roadmap to the year 2000. They are:

- Building a Quality Workforce
- What Work Requires of Schools: A SCANS Report for America 2000
- America 2000 - An Education Strategy

Building a Quality Workforce

Building a Quality Workforce is a joint initiative of the U.S. Departments of Labor, Education, and Commerce. Distributed in July 1988, it is a coordinated attempt by the executive branch to create a bridge between business and education. It recognizes the concerns raised in A Nation at Risk are not an end in themselves. Educators must address these concerns within the context of employer needs. The findings and conclusions parallel those found in A Nation at Risk:

Findings

1. The rate of change in the workplace is rapidly accelerating.
2. Job skill requirements are changing regardless of the type of business.
3. The skills gap between entry level workers and business is widening.
4. Entry level workers are deficient in the basic skills of reading, writing, mathematics, and communications. They lack initiative, adaptability, teamwork, and the capability to solve problems.
5. Loss of productivity and competitiveness cost American business.
6. Educators agree with overall goals, but must translate that understanding into what happens in the classroom.
7. Business must anticipate future needs and develop ways to convey those needs to educators.
8. Non-college bound and dropouts have been least affected by educational reform.¹⁰

Conclusions

1. Strengthen our Educational System

- o Increase accountability of schools
- o Strengthen curriculum
- o Recruit good teachers
- o Improve performance of the disadvantaged
- o Increase competitiveness of schools

2. Expand Business Involvement

- o Advocate schools in the community
- o Increase collaboration between the business and education communities
- o Promote good management practices such as accountability and merit pay.
- o Improve projections of labor force needs.

Building a Quality Workforce firmly rooted the principle that there is a direct link between a quality workforce and quality education.¹¹ This approach required the mobilization of not only the education system, but also the businesses and the community. How did the Departments of Labor, Commerce, and Education undertake this mobilization? They did it by supporting what they labeled "Community Partnerships that Work".

Prince George's County, Maryland, is one of the three examples. There is an Advisory Council for Business and Industry of the Prince George's County Public School System which funnels assistance and resources into a variety of programs. The Prince George's County Private Industry Council matches high school graduates to available jobs. Local businesses helped the Superintendent recruit better teachers by offering perks such as reduced rents and interest rates on car loans. The results produced by this business-education partnership are measurable. In 1984, California Achievement Scores were below the national norm and only 40% of secondary black students passed the comprehensive

reading exam. By 1988, CAT scores were at the 73rd percentile and 89% of the black students passed the state functional reading exam.

Ultimately the business-education partnership identified a weak area that needed further investigation. A Prince George's County Career Education Task Force studied the problem of "what are the basic employability skills needed to succeed in the world of work?" Their Task force recommended that every student should have these skills upon graduation. The question that remained is "What are these skills?"

What Work Requires of Schools -- A SCANS Report for America 2000

In June 1991, through The Secretary's Commission on Achieving Necessary Skills (SCANS), the Secretary of Labor answered this question. The Commission completed their report after spending 12 months talking to employers, workers, union officials and educators. Their three major conclusions are not surprising:

1. All American high school students must develop a new set of competencies and foundation skills if they are to enjoy a productive, full, and satisfying life.
2. The qualities of high performance that today characterize our most competitive companies must become the standard for the vast majority of our companies, large and small, local and global.
3. The nation's schools must be transformed into high-performance organizations in their own right.¹²

Eight areas form the heart of the SCANS program. The first five areas are competencies that students must attain to be productive as members of the workforce. These five SCANS competencies (see Figure 1) are the bridge between the educational system and the workplace.¹³ These competencies are distinct from

FIVE COMPETENCIES

Resources: Identifies, organizes, plans and allocates resources

- A. Time -- Selects goal-relevant activities, ranks them, allocates time, prepares and follows schedules
- B. Money -- Uses or prepares budgets, makes forecasts, keeps records, makes adjustments to meet objectives
- C. Material and Facilities --Acquires, stores, allocates, and uses material or space efficiently
- D. Human Resources -- Assesses skills, distributes work accordingly, evaluates performance, provides feedback

Interpersonal: Works with others

- A. Participates as Member of a Team -- contributes to group effort
- B. Teaches others new skills
- C. Serves Clients/Customers -- works to satisfy customers expectations
- D. Exercises Leadership -- communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
- E. Negotiates -- works toward agreements involving exchange or resources, resolves divergent interests
- F. Works with Diversity -- works well with men and women from diverse backgrounds

Information: Acquires and uses information

- A. Acquires and Evaluates Information
- B. Organizes and Maintains Information
- C. Interprets and Communicates Information
- D. Uses Computers to Process Information

Systems: Understands complex inter-relationships

- A. Understands Systems -- knows how social, organizational, and technological systems work and operates effectively with them.
- B. Monitors and Corrects Performance -- distinguishes trends, predicts impacts on system operations, diagnoses deviations in systems' performance and corrects malfunctions
- C. Improves or Designs Systems -- suggests modifications to existing systems and develops new or alternative systems to improve performance

Technology: Works with a variety of technologies

- A. Selects Technology -- chooses procedures, tools or equipment including computers and related technologies
- B. Applies Technology to Task -- Understands overall intent and proper procedures for setup and operation of equipment
- C. Maintains and Troubleshoots Equipment -- Prevents, identifies, or solves problems with equipment including computers and other technologies

Figure 1

technical skills. They are competencies required by workers at all levels in the workforce.

The underpinning for these competencies is a three-part foundation which covers both basic skills and personal qualities.

This Three-Part Foundation divides into:

1. **Basic Skills:** Reads, writes performs arithmetic and mathematical operations, listens and speaks.

2. **Thinking Skills:** Thinks creatively makes decisions, solves problems, visualizes, knows how to learn and reasons.
3. **Personal Qualities:** Displays responsibility, self esteem, sociability self-management, and integrity, and honesty.

These basic skills transcend the traditional 3 R's of reading, writing and computation. These are "intellectual skills and personal qualities that are part of each of the five competencies."¹⁴

How is the Labor Department implementing the Commission's strategy? Through a program outlined in their publication -- Blueprint for Action: Building Community Coalitions. This publication includes all the information needed to start a community business-education coalition and eventually engage the entire community in SCANS activities. In addition to the information contained in the publication, their SCANS TOOLBOX includes:

- o A SCANS Hotline
- o The SCANS Information Kit
 - Sample Press Releases
 - Sample letters to engage support by parents, etc.
 - Radio/TV/Newspaper announcements
 - SCANS Workplace Know-How Card
- o Contacts in the Labor Department and regional offices
- o Bibliography of relevant publications
- o A sampling of SCANS-related examples.

The Labor Department met their goal. As Secretary of Labor, Lynn Martin stated, "SCANS defines a common core of skills that constitute work readiness for the jobs of today and tomorrow. Defining core skills is an important step, but only a first step."¹⁵ SCANS provided the structure and conduit for getting

information to the schools on what business needs. Now it is up to the schools to act.

America 2000: An Education Strategy

President Bush declared himself the "Education President" during his 1988 presidential campaign. At the White House on April 18, 1991, he presented his National Education Strategy. AMERICA 2000: An Education Strategy is the label for this long range plan that can lead the nation into the 21st Century. This statement summarizes the direction for America 2000:

Our vision is of four big trains, moving simultaneously down four parallel tracks: Better and more accountable schools; a New Generation of American Schools; A Nation of Students continuing to learn throughout our lives; and communities where learning can happen.¹⁶

AMERICA 2000 is a community and state blueprint -- not a Federal program. It is the implementing strategy for the attainment of the six national education goals adopted by the President and the Governors in 1990. The Federal government helps "by setting standards, highlighting examples, contributing some funds, providing flexibility in exchange for accountability, and pushing and prodding."¹⁷

Making all schools better and more accountable is the first part of the President's four part plan. He wants the National Educational Goals Panel to establish World Class Standards for the five core subjects of English, mathematics, science, history, and geography. Carrying out a nationwide testing system based on these world class standards will nurture good teaching and learning.

Students who distinguish themselves on these achievement tests earn Presidential Citations for Educational Excellence. Needy students can receive Presidential Achievement Scholarships.

This national examination system will provide a report card for parents to correlate how their children are doing compared to other students in the same school. Local schools can relate their performance to other schools in their district, the state, or even the entire nation. This ability to tell students and schools how they are doing induces accountability. An effective means of enforcement for this program of accountability is choice. "If standards, tests, and report cards tell parents and voters how their schools are doing, choice gives them leverage to act."¹⁸

Choice allows parents to determine the school their children attend. Choice is an incentive for schools to adopt policies that make them better. Some of the Federal government initiatives to spur those changes are:

- The school as a site of reform: Cut Federal red tape "to create state and local policy environments in which school-by-school reform can succeed."¹⁹
- Merit Schools Program: Provide Federal funds for use as rewards.
- Governors' Academy for School Leaders and Teachers: Academies established with Federal funds to improve school leaders, principals, and teachers.
- Differential Pay and Honors Teachers: Differential pay and honors for the best teachers.
- Alternative Teacher and Principal Certification: Insures well qualified subject experts can overcome barriers to entering the teaching career field.

Creating a New Generation of American Schools is the second part of the President's four part plan. American business people and educators will get together to create and set up innovative schools that meet the national education goals of AMERICA 2000. The Federal government provides funds for the first 535+ New American Schools (one for every congressional district).

The third part of the President's plan focuses on the "85 per cent of America's workers for the year 2000 (who) are already in the work force."²⁰ Concentrating on today's and tomorrow's students is not enough. To meet the challenges of the future today's workers must continue to improve through continuing education and strengthened job training programs. His strategy includes pushing for a renewed Adult Education Act. He would set up Skills Clinics in every community where workers can receive help to improve themselves.

The final part of the President's four part plan takes aim at communities. Learning takes place only in communities where business, schools, and parents are all involved. Learning occurs in communities which are safe from violence and drugs. The President intends to strengthen Federal programs that would aid local officials in reaching his goals. He also is reducing the Federal bureaucracy that limits local community flexibility and innovation.

This discussion of AMERICA 2000: An Education Strategy identified the Who, When, Where, and How. Who? is the President of the United States. When? is by the year 2000. Where? is at the

local community level. How? is through the four part strategy outlined in AMERICA 2000. The question that remains is What? -- what are the goals? The goals are the six National Education Goals adopted by President Bush and the nation's governors in 1990. Figure 2 clearly presents these by simply stating them:²¹

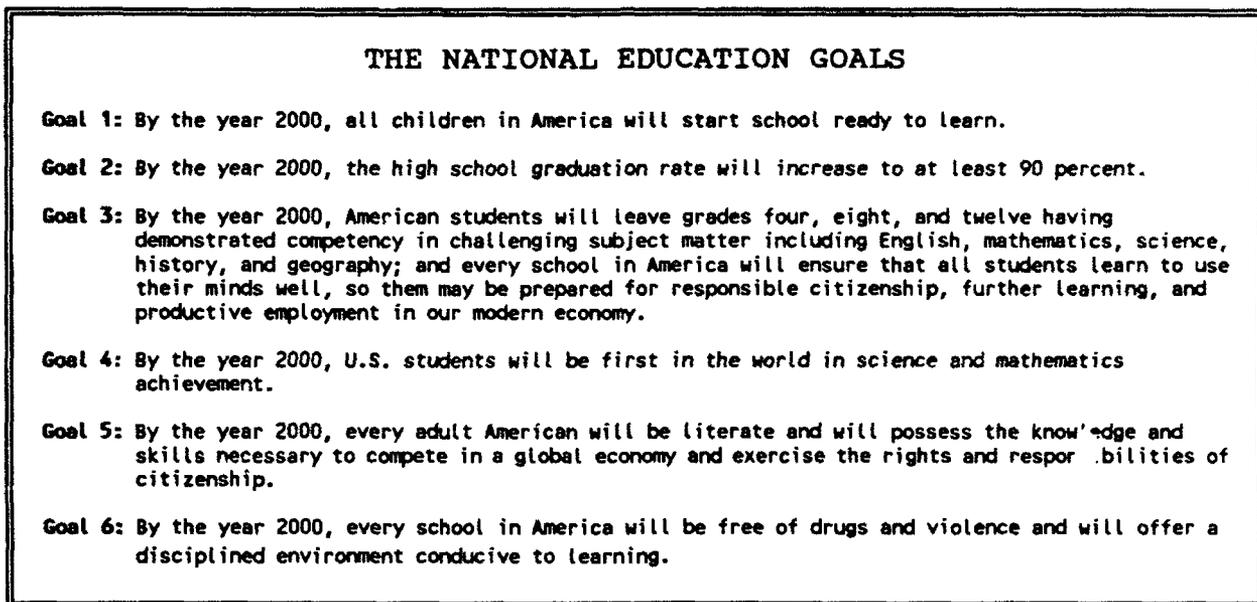
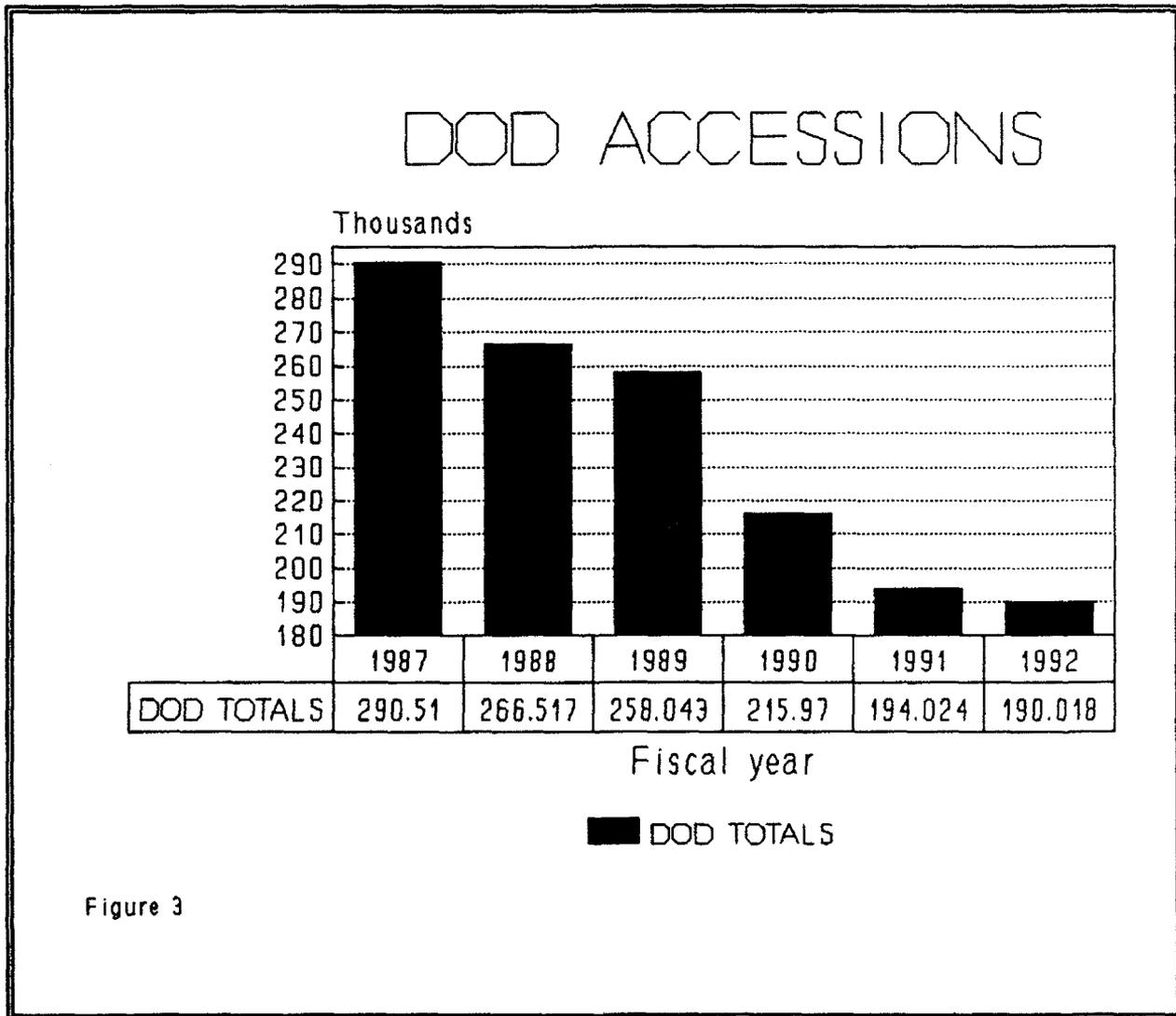


Figure 2

These goals are the basic ingredient in the four part AMERICA 2000 Education Strategy. Goal 4, first in science and math, emphasizes part one. All six goals "are the principal standard against which every New American School will be measured."²² Goal #5 and part three affect those already in the workforce. AMERICA 2000 communities are only possible with a reduction in drug use (Goal 6). Will the attainment of these goals guarantee a better military force in the year 2000? Before answering that question, an analysis of current DOD accessions will provide some insights.

DOD Accessions

The President's 1993 budget request forecasts a 25% reduction in the size of the U.S. military forces by FY 1997. Added to the 15% reduction that has already occurred since 1982, this is a significant decrease resulting in our military forces numbering less than 1.6M by FY 1997. Members of the Congressional staff are



already predicting that 1.6M is not a good number. What is the effect on accessions? Figure 3 shows the decline in accessions just since 1987. This 35 percent decline in the number of yearly

accessions since 1987 reflects the significant decline in the total manpower needs of the military over the last five years. From the 1987 baseline, this is a cumulative reduction of more than 325,000 men and women. From now until the year 2000 the number of accessions is uncertain. Based on the continuing reduction in the size of the military, 190,000 a year is probably the top line.

Applicant Pool

What is the impact of these declining DOD accessions on the quality of the men and women actually recruited? A Nation at Risk caused the military to ask -- was the overall quality of their recruits declining? In the Reagan era of increasing budgets, the military perceived an environment in which increased recruiting demands would clash with a declining population of competent and prepared 18-20 year-olds. In 1992, the answer is notably different from DOD expectations in the 1983-1988 timeframe.

To understand the current recruiting situation we must first examine the demographics of those recruits entering the military. Since 1987, there has been a prominent increase in the education levels of those entering military service. This continues the trend begun when Congress created the all volunteer force in the 1970s. As Figure 4 (page 18) illustrates, by 1991 the number of non-high school graduates shrunk to less than .4 of one percent of the total. Out of 194,567 accessions (minus unknowns) in 1991, only 781 were non-high school graduates. Those with high school diplomas, vs GED certificates, grew from 85% of the total in 1987 to 93% of the total in 1991. College graduates are supporting this

DOD ACCESSIONS Education Levels

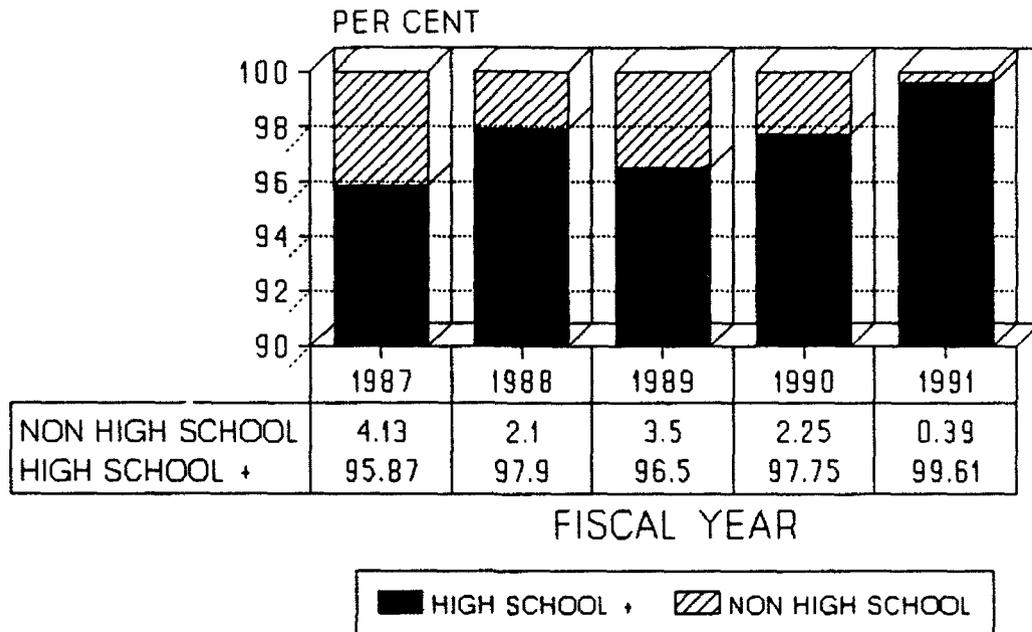


Figure 4

trend. As a percentage of the total, college graduates entering the military doubled from 1987 to 1991 (see ATCH #2).

Even in the face of reduced manpower needs can this trend continue to the year 2000? The Department of Defense is confident that it can. If one looks at the primary pool for military recruiting, high school graduates and college undergraduates, Figure 5 (page 19) clearly illustrates their numbers are increasing between 1992 and 2001. High school graduates are increasing from 2.5 million in 1992 to 3.2 million by 2001. College undergraduate enrollment is increasing from 11.6 million to 12.4 million. This

Education Projections

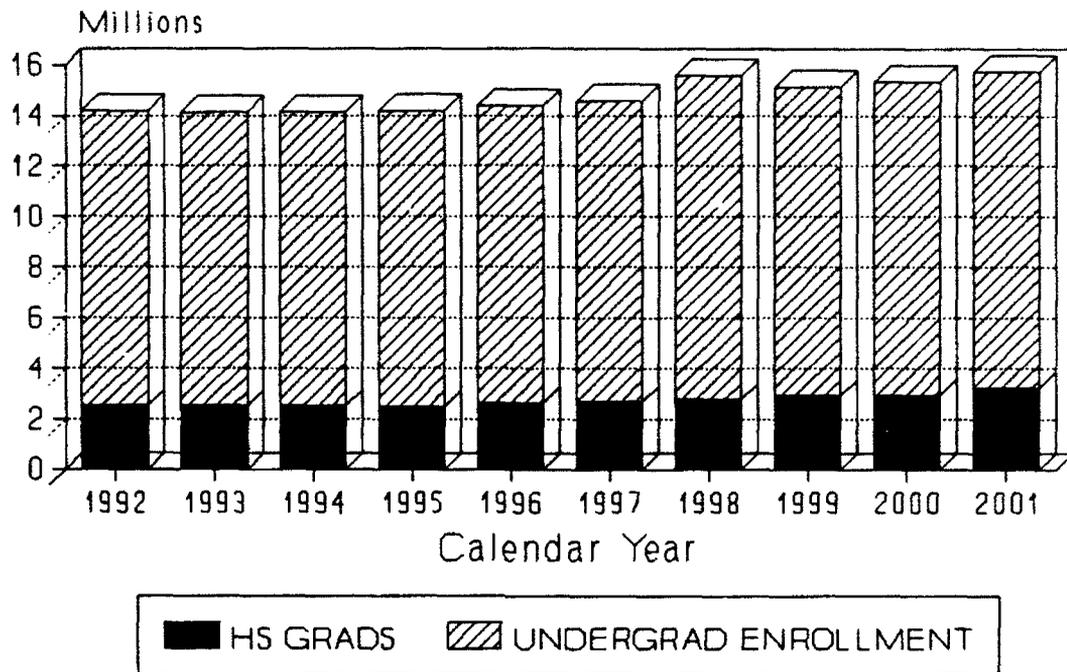


Figure 5

is a direct result of the children of the baby boomers reaching the 18-20 year-old age bracket. The military is recruiting fewer people from a primary pool of applicants that is increasing.

The first part of the discussion on the applicant pool addressed the question of quantity. This doesn't answer the concerns raised about quality in A Nation at Risk. Isn't the quality of our high school and college graduates diminishing? We must examine this question of quality from two different directions.

First, the nations' schools have improved since the National Commission on Excellence made their report in 1983. In his 1988 report to the President and the American people, American Education: Making it Work, William J. Bennett, U.S. Secretary of Education stated:

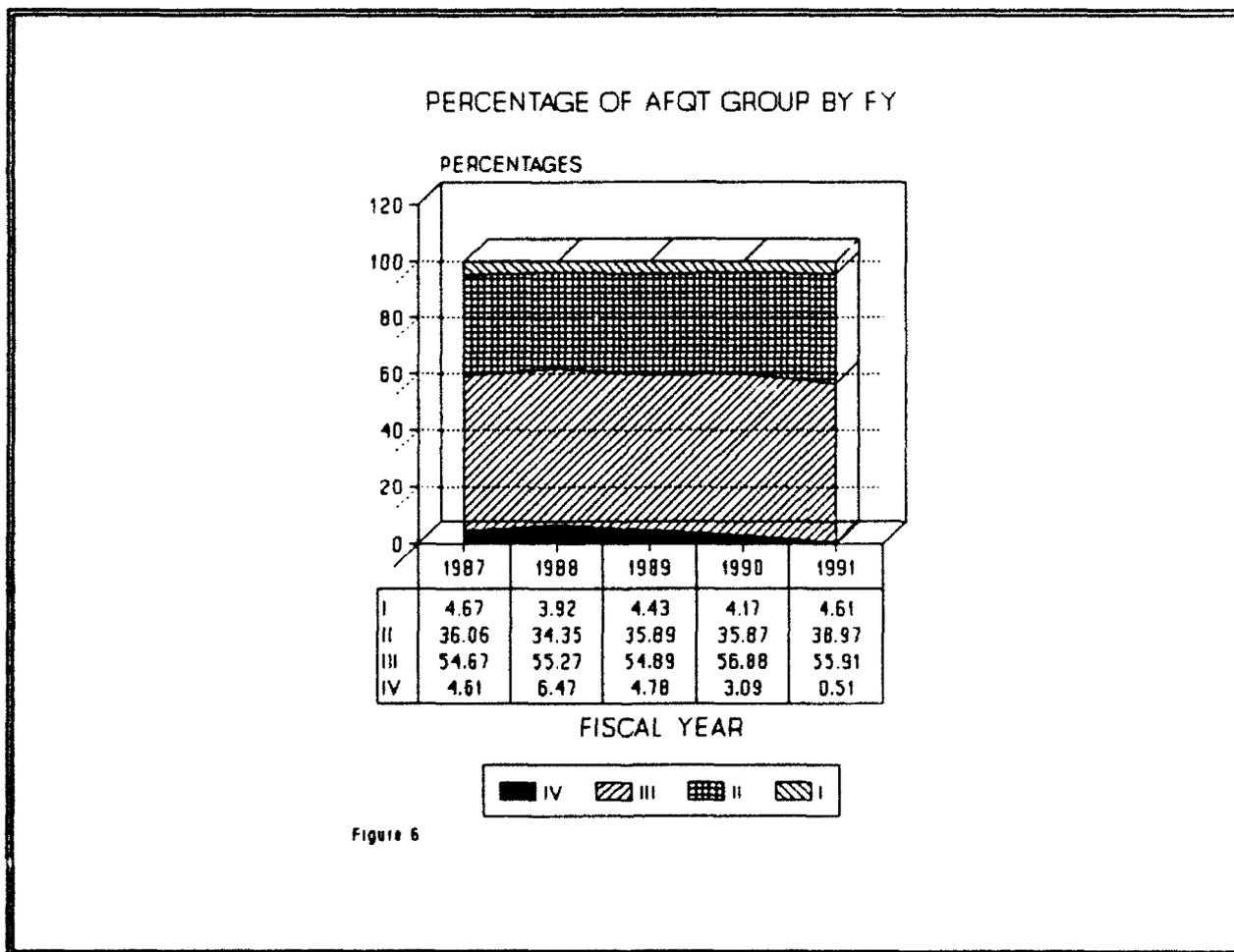
American education has made some undeniable progress in the last few years. The precipitous downward slide of previous decades has been arrested....we are doing better than we were in 1983.²³

American Education: Making it Work assessed the question of "How Far Have We Come?" and found some positive trends. Most states have increased their high school graduation requirements. Per capita spending for elementary and secondary education has increased by 40%. Combined SAT scores have recovered 16 points since 1980.²⁴ Student performance on achievement tests in reading, writing, mathematics, science, and geography is measurably better.²⁵ More students are taking and completing advanced science and math courses. The number of students taking Advanced Placement courses doubled. For high school students, the primary military recruiting target, the indicators are nearly all positive.

Second, there is an objective method to measure the quality of recruits that actually enter the military. From 1950 to 1976, the Department of Defense measured the aptitude of all potential recruits with the Armed Forces Qualification Test (AFQT). In 1976, the military went to a service-common test, the Armed Services Vocational Aptitude Battery (ASVAB). The AFQT comprises the verbal

and mathematical ASVAB subtests and is the most important composite for making comparisons. The Department of Defense knows through 40 years of research that aptitude scores strongly relate to training and job performance.²⁶ The following are categories of AFQT scores:

AFQT CATEGORY	PERCENTILE RANGE
I	93-99
II	65-92
III	31-64
IV	10-30
V	1-9



The services vigorously recruit individuals in Category I through Category III. Public law prevents individuals in Category V from joining the military. The services further divide Category III into Category IIIA (50-64) and Category IIIB (31-49). Very few people from Category IIIB or Category IV enter the service. In fiscal year 1991, only 994 individuals (.5 of one percent) enlisted from Category IV.

The data in Figure 6 reveals from 1987 to 1991 the recruitment in each aptitude category remained stable. This stability excluded a desirable trend of reduced accessions in the lowest categories. The market for recruiting has been very favorable over the last decade and DOD expects no major changes to this environment.²⁷ One trend is notable. As the educational levels of the military recruit increased, a reasonable expectation is that AFQT scores should also have risen. Figure 6 doesn't reflect this tendency.

Military Recruitment and Training 2000

This paper's starting point is the decline in American education identified in A Nation at Risk. Building a Quality Workforce confirmed the concept that a specific purpose of education is to prepare the individual for the workplace. The Secretary's Commission on Achieving Necessary Skills identified the skills needed in the workplace and is building bridges between business and education. AMERICA 2000 proposed a National Education Strategy to take America into the 21st Century. The strategic question for the military is -- so what? What is the impact of

these initiatives on military recruiting and training with the approach of the 21st Century?

The discussion on DOD recruiting points to the assumption that the military can be discriminating about accessions. An increasing applicant pool with a diminishing need insures the military can attract high quality recruits. The services stick to a valid rule that they "try to set standards as high as applicant supply and recruiting permit. For, no matter where it is set, a higher standard will yield more productive results."²⁸ If the services can continue to recruit the "best of the best" does this guarantee that recruits will be easily trainable, and perform satisfactorily in their jobs? On a graph we would say it is a question of slope. Can the growing quality of recruits stay ahead of an increasing need to operate in an environment of increasing technology? The military services perceive their recruits reflect current America society and that society is failing to keep pace.

Will AMERICA 2000 improve the quality of the military recruit? If the states and local communities implement the four part plan and achieve the six national educational goals, it certainly should. Discussions about recruits with senior and mid-level NCO's and petty officers center on the same goals identified in AMERICA 2000 and What Work Requires of Schools. New members of the military need to improve their basic skills of reading, writing, and computation. In my job as the Air Training Command Training Advisor to Strategic Air Command, the largest user of enlisted

training in the Air Force, the most common demands of supervisors in addition to basic skills was:

- Better troubleshooting skills
- Capability to work as part of a team
- Mastery of computers and information management systems

Their desires closely parallel many of the six goals in AMERICA 2000 and the five competencies in What Work Requires of Schools.

Savings

A better education system will enhance training capability, but the question is -- how much? The military services spend more than 5 billion dollars per year on initial and advanced recruit training.²⁹ Even improvements on the margins produce noticeable savings on an expenditure this large.

Increasing the quality of recruits generates savings by decreasing attrition rates and cutting remedial training for initial training courses. The military services spend millions of dollars each year on remedial training. The prevalent focus of this training is on the basic 3 R's and computers. Often forgotten is costly remedial training in the areas of drug abuse, domestic violence, and interpersonal relationships. AMERICA 2000 and What Work Requires of Schools target these same areas.

Savings are achievable in other ways. Decreasing course lengths or completing more training in the same period creates savings. Better prepared students permit managers to reduce course lengths. Cutting or reducing the extensive knowledge leveling process occurring at the front end of many training courses also generates savings. Better students absorb the same amount of

material in a shorter time. Fiscal restraints usually take precedence over curriculum in specifying course lengths and better prepared students means more material covered in the same period. Shortening courses or increasing training in the same period are both highly desirable goals. Both also help trainers avoid a collision between a decreasing military training budget and the ever increasing complexity of new systems.

Industrial Training Model

The impact of these presidential initiatives, although significant, is only effective on the margins because of the training system used by the military services. This system is the industrial training model. The industrial revolution gave birth to this system and World War II perfected it.

An unskilled new-hire is the assumed input into the industrial training system. Initial training for that worker is a building block system of skill levels and tasks. The skill levels for each task range from "Can perform the task under supervision with only minor deviations" to "Can teach other individuals the task". A worker learns simple tasks and then combines individual tasks together to form more complex task elements. When these task elements are combined they describe a worker's job.

In World War II, on a fighter assembly line, a trainer might first have taught a worker to install rivets on a wing. After the worker mastered that task, the trainer added and combined tasks until the worker could produce the entire wing assembly or even the entire airplane. As systems became more complicated, supervisors

permanently divided tasks into specialties. In the above example, the workers who assembled and installed the engine became a separate specialty from the sheet metal workers.

This system of training and division into specialties is the structure still used by the military services. The Air Force divides their enlisted personnel into Air Force Specialty Codes (AFSCs). The Army calls them Military Occupational Specialties (MOS) and the Navy term is Naval Enlisted Code (NEC). A growing complexity of both the missions and weapons systems forced the services to divide and subdivide into a labyrinth of specialties to meeting training and mission standards.

For some specialties a dilemma results because the course lengths for even the most basic apprentice courses are a year or longer. Some Air Force apprentice avionics courses are more than 260 training days. If you add basic military training and primary on-the-job training as part of the initial training cycle, the payback on a four year enlistment may be only two years. The training-payback dilemma should improve with better recruiting and achieving the goals in AMERICA 2000. The military services are also improving training delivery thorough new computer-aided instruction technologies such as inter-active video disk and intelligent tutoring. These are short term answers that may not produce long term solutions.

Solutions

"Train before buy" may be the long term solution. In this model, the military would contract with institutions that could

attract, train, and supply individuals with specific skills. An example might be automobile mechanics. A school such as the Wausau Vocational-Technical School would contract with the military to provide automobile mechanic courses meeting certain specifications. The military would write two-way contracts with individuals enrolled in the courses guaranteeing enlistment upon successful completion of the course.

Through a series of these partnerships, similar to the Community-Education partnerships advocated in the SCANS report, the military could realize significant savings. These savings would include not only the training costs, but also the normal costs associated with maintaining a person on active duty while they are basically not contributing to the mission.

This is not a new proposal. The Air Force, Army, and Navy are all studying assorted renditions of this concept. Many factors prevented any real implementation of this concept. It is not possible to quantify the trust in the American education system as the key factor, however, A Nation at Risk didn't provide a high level of confidence in those exploring the concept. Achieving the goals in AMERICA 2000 will overcome this reluctance to deal with the American education system.

As the length of training courses for sophisticated technologies continues to increase, the military service will gradually implement the "train before buy" concept. Reduced training budgets and a reduced force size requires the services to examine the ratio of those in training to operational requirements.

Operational requirements always win the battle with training. More effective training delivery is a factor, but will lag operational technologies.

The military will feel the major impact of AMERICA 2000 when the "train before buy" system produces large numbers of recruits who by-pass the traditional military training system. The military now depends only indirectly on the American education system since it retrains all recruits. In the "train before buy" system the quality of the United States military banks on the quality of the education system.

Recommendations

One of the profound lessons of Desert Storm is the high technology weapons systems of the United States work. These weapons require a high quality force to operate and maintain them. This quality directly results from high quality accessions and a superb training system. Challenging this training system is an increasingly complicated technological workplace. AMERICA 2000 could help meet those challenges. The recommendations are:

1. The Department of Defense study and support the goals in AMERICA 2000 and the SCANS report. An excellent start is the new Educational Defense Industry Study at the Industrial College of the Armed Forces.
2. The Office of the Secretary of Defense should report the results of these studies to the Departments of Education and Labor for their action and long range planning.
3. The Department of Defense must uphold accessions policies that insure the services receive the highest quality recruits.

4. The military training communities should explore the "train before buy" concept as a possible solution to the challenges facing future training.

Prospects

The governors and President Bush are forging ahead with their national education strategy. The prospects for implementation of programs that pursue achievement of their six national education goals look promising. The governors in thirty-two states have inaugurated America 2000 programs and that number should quickly climb to forty. The goals are challenging. Educators face difficulties when trying to check progress toward those goals, but measurable improvements in the educational system are occurring. If a national focus on education persists, those improvements should continue.

The prospects for military recruiting also appear bright. The quality of DOD accessions should remain high and AMERICA 2000 should improve that quality. The military can recruit all high school graduates who are in the highest aptitude categories.

The future of military training is unclear. The current system is still the best for most military training. Reduced training dollars, however, will force the military to restructure training. The first choices for the "train before buy" system are skills that are easily transferrable from the civilian to the military workforce. Savings are also possible for the longer training courses. The improvements generated by AMERICA 2000 cannot meet all the future training needs of the military.

ENDNOTES

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8. Ibid., p.22.
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10. Building a Quality Workforce. A Joint Initiative of the U.S. Department of Labor, U.S. Department of Education, and U.S. Department of Commerce. Washington D.C., U.S. Government Printing Office, July, 1988, pp. 4-5.
11. Ibid., p.35.
12. What Work Requires of Schools: A SCANS Report for America 2000. Washington D.C., U.S. Government Printing Office, June, 1991, p. vi.
13. Ibid., p. xvii.
14. Ibid., p.15.
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17. Ibid., p.12.
18. Ibid., p.22.
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20. Ibid., p.55.
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22. Ibid., p.25.
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24. Ibid. p.8.
25. Ibid. pp. 10-14.
26. Janice H. Laurence, Peter F. Ramsberger and Monica A. Gribben, Effects of Military Experience on the Post-Serv. ce Lives of Low-Aptitude Recruits: Project 100,000 and the SVAB Misnorming (Alexandria, VA:Human Resources Research Organization, December, 1989), p.2.
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DEPARTMENT OF DEFENSE NPS ACCESSIONS FISCAL YEARS 1987 - 1991

AFQT GROUPS	NON-HS <-3	NON-HS 3-4	GED CERT	HS COLLEGE GRAD	COLLEGE 1-2	COLLEGE 3-4	COLLEGE GRADS	TOTAL
PERCENTAGE OF AFQT GROUP BY YEAR GROUP								
FISCAL YEAR 1987								
I	0.02%	0.04%	0.06%	3.12%	0.85%	0.17%	0.40%	4.67%
II	0.74%	0.92%	1.01%	28.87%	3.24%	0.42%	0.86%	36.06%
III	1.24%	1.18%	1.42%	48.08%	2.14%	0.24%	0.37%	54.67%
IV	0.00%	0.00%	0.00%	4.47%	0.11%	0.01%	0.01%	4.60%
TOTAL	2.00%	2.13%	2.49%	84.54%	6.34%	0.85%	1.64%	100.00%
FISCAL YEAR 1988								
I	0.01%	0.03%	0.07%	3.43%	0.06%	0.01%	0.31%	3.92%
II	0.51%	0.66%	1.39%	30.32%	0.31%	0.03%	1.14%	34.35%
III	1.10%	1.19%	2.36%	48.71%	0.20%	0.02%	1.68%	55.27%
IV	0.00%	0.01%	0.01%	6.20%	0.02%	0.00%	0.22%	6.47%
TOTAL	1.62%	1.89%	3.82%	88.66%	0.59%	0.05%	3.36%	100.00%
FISCAL YEAR 1989								
I	0.02%	0.03%	0.09%	3.81%	0.09%	0.01%	0.39%	4.43%
II	0.40%	0.47%	1.52%	32.09%	0.39%	0.05%	0.97%	35.89%
III	0.62%	0.56%	2.18%	50.51%	0.29%	0.02%	0.70%	54.89%
IV	0.00%	0.01%	0.00%	4.73%	0.02%	0.00%	0.02%	4.78%
TOTAL	1.04%	1.07%	3.80%	91.14%	0.78%	0.09%	2.08%	100.00%
FISCAL YEAR 1990								
I	0.01%	0.02%	0.03%	3.72%	0.06%	0.01%	0.32%	4.17%
II	0.36%	0.48%	0.94%	32.61%	0.29%	0.04%	1.16%	35.87%
III	0.70%	0.69%	1.50%	52.25%	0.23%	0.02%	1.49%	56.88%
IV	0.00%	0.01%	0.00%	2.98%	0.01%	0.00%	0.09%	3.09%
TOTAL	1.07%	1.18%	2.48%	91.56%	0.59%	0.06%	3.05%	100.00%
FISCAL YEAR 1991								
I	0.00%	0.01%	0.04%	4.00%	0.07%	0.01%	0.47%	4.61%
II	0.02%	0.13%	0.87%	36.08%	0.39%	0.03%	1.44%	38.97%
III	0.04%	0.19%	1.21%	52.86%	0.24%	0.01%	1.36%	55.91%
IV	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.01%	0.51%
TOTAL	0.06%	0.33%	2.12%	93.45%	0.71%	0.06%	3.27%	100.00%
ALL FISCAL YEARS								
I	0.19%	0.24%	0.29%	9.79%	0.83%	0.11%	0.49%	11.93%
II	0.56%	0.63%	1.28%	36.63%	0.78%	0.09%	0.98%	40.95%
III	0.51%	0.54%	1.45%	40.33%	0.21%	0.02%	1.01%	44.05%
IV	0.00%	0.01%	0.00%	2.98%	0.01%	0.00%	0.07%	3.07%
TOTAL	1.25%	1.41%	3.01%	89.73%	1.83%	0.21%	2.55%	100.00%

DOD ACCESSIONS
PERCENTAGES OF EDUCATION LEVEL BY FISCAL YEAR

	NON-HS <-3	NON-HS 3-4	GED CERT	HS GRAD	COLLEGE 1-2	COLLEGE 3-4	COLLEGE GRADS	TOTAL
1987	2.00%	2.13%	2.49%	84.55%	6.33%	0.85%	1.65%	100.00%
1988	1.04%	1.07%	3.80%	91.13%	0.78%	0.09%	2.10%	100.00%
1989	1.61%	1.89%	3.82%	88.67%	0.59%	0.05%	3.36%	100.00%
1990	1.07%	1.18%	2.47%	91.57%	0.59%	0.06%	3.05%	100.00%
1991	0.06%	0.33%	2.12%	93.47%	0.69%	0.06%	3.27%	100.00%
TOTAL	1.24%	1.40%	2.99%	89.49%	2.01%	0.25%	2.62%	100.00%

DOD ACCESSIONS
PERCENTAGES OF EDUCATION LEVEL BY FISCAL YEAR

	NON-HS	HS +	TOTAL
1987	4.13%	95.87%	100.00%
1988	2.10%	97.90%	100.00%
1989	3.50%	96.50%	100.00%
1990	2.25%	97.75%	100.00%
1991	0.39%	99.61%	100.00%
TOTAL	2.64%	97.36%	100.00%