This report is adapted from a letter sent to President-Elect George Bush in early January 1989. The report was published to stimulate a broad public discussion of the role that the Federal Government might play in developing the skills of the Nation's people. The priority of preventing damage to young children is the topic of the first section. In the second section, three design programs for restructuring the schools for high performance are described: (1) high performance schools; (2) school to work transition; and (3) social service integration. The third section asks the President to declare a goal of matching the mathematics and science performance of students to those in all other countries by a certain date as well as devising a national strategy for achieving the goal. The last section addresses the Nation's problem of adult illiteracy and the need for high levels of work force training. Appended is a publication order form. (SI)
THE NATIONAL CENTER ON EDUCATION AND THE ECONOMY

The National Center on Education and the Economy is a not-for-profit organization created to develop proposals for building the world class education and training system the United States must have if it is to have a world class economy. The Center engages in policy analysis and development and works collaboratively with others at local, state and national levels to advance its proposals in the policy arena.

THIS REPORT

This report, prepared by the Trustees and staff of the National Center, is adapted from a letter sent to President-Elect George Bush in early January, 1989. We publish it in this form to help stimulate a broad public discussion of the role that the federal government might play in developing the nation's most vital asset—the skills of its people.

ACKNOWLEDGEMENTS

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In the course of preparing this report, the National Center commissioned several papers. The paper authors are not, of course, responsible for the use we have made of their work, nor does the Center necessarily agree with the positions they have taken on the issues.

An order form for the report and papers can be found at the end of the report.
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HE CASE FOR education has been made repeatedly in recent years. It is clear now that a high wage economy depends upon producing high quality goods and services at high levels of efficiency, which cannot be done without a highly skilled work force. It is equally clear that social justice will not be secure until all Americans have the opportunities that only education can provide. Only when all our people are fully educated will the country be truly united.

The question is not whether it is important to produce enormous gains in the skills of our people, but how to do it. Many would say the answer is money. But we do not propose large increases in federal funding for education, at least not now. Education, like private industry, can improve by restructuring operations following some very simple principles. First, go for quality and build it in the first time whenever possible. Second, reward success in producing quality. Third, when a system for real accountability is in place, let the people on the firing line figure out how to get the job done, and get rid of as much of the bureaucracy and as many of the intervening rules and regulations as possible.
These principles were first put forward as the basis for fundamental education reform in 1986 in reports from the Carnegie Forum on Education and the Economy and the National Governors' Association. These reports both reflected and stimulated fundamental changes in state policy. But those changes, however promising, will not—in fact, cannot—lead to sweeping improvements in national performance without strong national leadership.

We believe that only the President is in a position to establish a new American consensus on the need to build a world class system for education and commitment to high standards. Only the President can win the American people by committing this country to a goal for education as ambitious as those that John Kennedy declared for space exploration.

Only the President is in a position to persuade the nation that the survival of the American Dream in the 21st century depends on our ability to compete successfully in a global dynamic economy. The task is to be both a compassionate nation and one that can compete with the best. Individual freedom and a free market economy are valued principles which are the underpinnings of an American way of life that is the envy of...
... set a goal for the nation: Americans are going to be the best in the world at educating and training our people, whatever it takes!

The challenge is to provide an elite education for everyone.

the world. But a society based on individual freedoms can only be achieved when every citizen has the opportunity to get a quality education. Only an educated people and a trainable workforce will guarantee America's ability to compete successfully. This is why we must have nothing less than a world class American education system that, like our freedoms and way of life, will also be the envy of the world.

Only the President can set a goal for the nation. Americans are going to be the best in the world at educating and training our people, whatever it takes! The country must be challenged to make sure that, by the year 2000, the United States—

- will overtake Singapore, now first in 12th grade biology, from our current ranking of dead last in a ranking of 13 countries.

- will overtake Canada and Norway, where 24-25 percent of 18 year olds take physics and chemistry for two years each, compared to less than one percent in the United States.

- will overtake Japan and Korea, now tied for first in general science for 10 year olds, from our current rank of number eight

- will overtake Japan in the mastery of mathematics skills, which will require that our high school graduates master more math than our college graduates do now.

- will provide those of our high school graduates not going directly to college with apprenticeship skills equal to or even better than those of their West German counterparts.

- will overtake the functional literacy rates of our leading competitors in Europe and Asia, now around 90%, from our current rate of about 70%.

- will host teams of European and Asian managers coming here to find out how to train their workers, instead of sending our teams to Europe and Asia to find out how to train workers for high levels of productivity, as we do now.
• will triple expenditures made by American firms on the education and training of their workers, to equal the expenditures now made by their most able foreign competitors.

Achieving these objectives would require, in most of the cases cited above, more than a fifty percent improvement in performance in eleven years, a feat as difficult as any this country has ever set out to achieve. The United States will not solve its problem simply by lifting up the bottom, nor by concentrating on improved preparation of a small managerial elite. The challenge is to provide an elite education for everyone. The top fifth must be raised so that it is the equal in performance of any country’s top fifth. At the same time, the performance of the bottom fifth must be pushed far above where it is now. In what we have come to call the ‘information society,’ the essential passport to personal dignity for the individual and to economic security for the country as a whole is a first rate education.

We propose four missions in the service of this goal:

• First, America will do what is necessary to assure that every child starts school healthy and intellectually prepared to take full advantage of what school has to offer. No longer will millions of children enter kindergarten as damaged goods, already marked for failure;

• Second, the country will dedicate itself to restructuring elementary and secondary education for high performance, according to the principles previously suggested. By the end of the century, high school graduates all across the land will hold a diploma that signifies more than twelve years in the seat. It will testify that the holder is among the best educated high school graduates in the world;

First, America will do what is necessary to assure that every child starts school healthy and intellectually prepared to take full advantage of what school has to offer.

Second, the country will dedicate itself to restructuring elementary and secondary education for high performance.
Third, make our schools a showcase for the contributions that information technology can contribute to learning.

Fourth, provide a second chance to every American now in the workforce to get the skills they will need to contribute effectively in an information-based economy.

America needs to be reassured that the federal government does not propose to take over responsibility for education. America does not want and will not tolerate uniform federal standards for education. The states have the primary role in setting education policy. Firms and unions make policy for workplace training. The federal government is far from the most powerful among the many players that determine whether kids come to school healthy and well motivated or young school leavers get connected to the job market.

But the search for ways to produce a high performance system begins with a vision of what the country could and must accomplish. The essential precondition for having the best education system in the world is national determination. The first step in a national strategy for educational excellence is for the President to set the goals and challenge the nation to achieve them.

The American people should be told that more money will be needed, but that money alone will not solve the problem. The United States already is a leader in...
spending on education. It is essential to get much higher levels of quality for every
dollar spent. The way to begin is to get the incentives right, to make sure that there are
appropriate rewards for success and real consequences for failure. If we want quality
we should reward it. If we want student progress, we should reward it. If we want
efficiency in the use of public resources, we should reward it. These rewards are not
present now and it is a sure bet that the improvements that are needed in the quality of
education will not come about until they are

The time has never been more ripe for such a message to the American people
During the long presidential campaign, poll after poll showed that education placed
within the top three issues that the electorate wanted the candidates to address. Other
polls showed that the average citizen and top executives both believe that the skills of
Americans make a crucial difference in the ability of our firms and this country to
compete in world commerce. Still others showed that Americans are eager to support
proposals for a major restructuring of American education

But a Presidential challenge will hardly be credible unless the President is
prepared to join with the Congress in mobilizing the resources of the federal
government to meet that challenge. Here is what we suggest

If we want quality, we should reward it. If we want student progress,
we should reward it. If we want efficiency in the use
of public resources, we should reward it
REVENT DAMAGE TO YOUNG CHILDREN

Children who come to school healthy and well cared for do vastly better in school and in later life. The appalling conditions under which many young children grow up in our inner cities and poverty-stricken rural areas constitute a barrier to later achievement from which few recover. Many are now arriving for enrollment in first grade only to be held back because they are judged to be unready, labeled as failures before they have even begun school. Failure leads to hopelessness, which compounds failure. There are now fewer young Black men enrolled in four year colleges and universities than there are in our prisons. The cost to society, to say nothing of the individuals involved, is incalculable. We would give very high priority to prevention of damage to young children.

Investment in quality child care and early childhood development pays handsome dividends in school and later in life. A broad consensus has developed for a greatly expanded federal role in this area, which we support.

But the old turf fights between differing service providers at the local level should not be allowed to dictate the design of new federal legislation. The legislation should place a premium on encouraging states and localities to combine federal, state,
and local resources for full time day care, preschool child development centers and before and after school care programs. In order for such coherent strategies to emerge it will be essential to strengthen the role of the state government in the Headstart Program. New strategies are required that address local conditions and that do not grant hegemony to any one definition of need or any one class of service providers. The states, acting in collaboration with local communities, are in the best position to devise those strategies and federal policy should be designed to encourage and permit them to do that. But it is also imperative to find a way to produce high national standards for day care centers and for the professionals who run them.

Beyond Headstart, the federal government has had some real successes on which it can build. The program for Women, Infants and Children (WIC) merits increased support. It has proved its worth in providing vital support for good nutrition, prenatal care and improved parenting skills for low income parents and their children.

. . . strenghten the role of the state government in the Headstart Program.

. . . produce high national standards for day care centers and for the professionals who run them.

The program for Women, Infants and Children (WIC) merits increased support.
Success requires the invention and implementation of whole new approaches to the organization, management and staffing of our schools.

ESTRUCTURE THE SCHOOLS FOR HIGH PERFORMANCE

No business in America could survive with the failure rate we have long tolerated in our schools. Some observers have estimated that as much as 25% of the cost of higher education is the cost of remediation. Others have estimated that the cost to employers of remediating the deficiencies of those who enter the workforce right out of school will soon reach $25 billion a year.

The question is how to get much higher levels of performance out of the schools without greatly increasing the costs. The answer is to fundamentally restructure the enterprise to put the emphasis on performance. American schools will not leap to the head of the pack by just spending more on current programs or by adding a few new programs to the ones now in place. The schools will only succeed if they replace the basic structure that was put in place fifty years ago to meet the needs of a smokestack economy with a new structure that meets the needs of an information economy.
The challenge facing the federal government right now is to figure out how to play an effective role in making that process of restructuring take place.

A growing number of states and localities have made a start. The National Center on Education and the Economy is located in Rochester, New York because of that community's real commitment to restructuring its schools. Rochester and other communities that have made similar commitments are focusing on student performance, on producing very high rates of mastery of higher order thinking skills among all students. In the first instance, the object is to fill our schools with first rate teachers and administrators who themselves have those skills and are capable of developing them in their students. Because getting and keeping such people requires rates of pay that are competitive with that offered by business and the professions, many states and localities have worked hard—and successfully—in recent years to make teachers' pay rise considerably faster than inflation. Secondly, it requires setting up performance-oriented systems in which the goals for students are clearly specified, and rewards go to schools in which students make substantial progress toward those goals. Finally, it requires greatly reducing the bureaucracy in the system and giving

... fill our schools with first rate teachers and administrators

... performance-oriented systems in which the goals for students are clearly specified, and rewards go to schools in which students make substantial progress toward those goals.
greatly reducing the bureaucracy in the system and giving much more authority to school staffs, making this approach work requires coordinated changes in local, state and federal policies. Strategies must be devised for greatly improving teacher preparation and upgrading teacher licensure. Standards for student performance that reflect not the conventional basic skills but higher order thinking skills must be developed and methods of measuring student progress against those standards must be devised for use at local and state levels. New accountability and incentive systems need to be designed and tested. Radically different approaches to organizing schools and districts, arranging for funds flows, monitoring system performance and so on must be designed and implemented. New conceptions of school administration and management must be devised and people trained to make them work.

Some of the communities going down this road have been attempting to integrate their policies for schooling with their social service policies. This is necessary to bring some order to the lives of children who are often shuffled between agencies that see them only as clients for narrowly defined services, rather than individuals who need more than anything else the kind of coherent, caring environment that more fortunate children elsewhere take for granted.
Others have been trying hard to build bridges between the schools, employers and job training programs, looking for ways to motivate students who otherwise drop out of school and provide the kind of experiences and opportunities that will help them to make it in society.

Federal resources have been essential to the communities that have been pioneering these new approaches, but the current structure of federal programs has become a part of the problem rather than of the solution.

Federal programs for the disadvantaged are typically structured in ways that do not reward the improvement of student progress. In fact, the incentives are perverse. Money is withdrawn if success is achieved. Because the government requires that each category of disadvantaged student be fully and separately accounted for, and because each program operates under its own set of rules and requires its own application procedures, bureaucracies have been built up in the states and the districts around these programs, and the children are typically shunted from special class to special class, their education the particular responsibility of no one. The buck stops nowhere.

The problem runs deeper. Research shows conclusively that the Education for All Handicapped Act has produced significant gains for the physically handicapped and severely retarded, but the situation with respect to those classified as learning disabled and emotionally disturbed is less clear. As fiscal support for remedial education under Chapter 1 declined in recent years, there was a matching increase in the identification...
... the very act of labeling these children as 'learning disabled' and putting them in special classes containing only other children who have been so labeled lowers both their own expectations and the expectations that the teachers have of them.

...
that structure has stood still while a whole new approach to program improvement has been taking shape in the field.

Higher levels of government can create programs, provide money, and enforce minimum standards, but they cannot make schools, teachers, or training programs excellent. As we have just shown, the more higher levels of government try to force excellence by legislating and regulating it, the more they tie the hands of the very people on whose efforts and commitment excellence depends. The aim of federal policy should be to create the conditions under which local people have strong incentives to meet the needs of students and maximum freedom to figure out how to produce those results.

The initiatives for federal action we describe next are all of a piece, designed to work as a whole. Our first three proposals are called "design" initiatives, because they are intended to provide an opportunity for local communities, free of many of the constraints under which they now operate, to design high performance schools. They would operate in America's great central cities and rural communities where there is a high concentration of poverty. Viewed narrowly, they represent a laboratory in which basic changes can be made in the way federal programs are conceived and implemented, to greatly improve their effectiveness. More importantly, they provide an opportunity for the federal government to take the lead, working in partnership with the states and localities, demonstrating a whole new approach to the management of

The aim of federal policy should be to create the conditions under which local people have strong incentives to meet the needs of students and maximum freedom to figure out how to produce those results.

Our first three proposals are called "design" initiatives, because they are intended to provide an opportunity for local communities, free of many of the constraints under which they now operate, to design high performance schools. They would operate in America's great central cities and rural communities where there is a high concentration of poverty.
The other two proposals we make would put the federal government in the position of providing a whole range of vital support systems that will make it much easier for the states and local communities to play their parts in the restructuring process.

But we would not begin by changing the federal programs that are now in place. What we have in mind is a very large experiment that would provide the information needed for a general redrafting of the basic federal programs later. The recent experience with federal welfare programs is instructive. The new federal welfare program design followed a period of several years during which there was a good deal of experimentation at the state level, made possible by the granting of selective waivers from existing federal policy, from which the principles that now govern the new legislation emerged. We believe something similar is called for in this case.

The basic principle is simple. People in local communities would be invited to propose high standards they think they can get their students to meet if they were free of many of the constraints under which they now operate, standards that approach or match the best performance in the world. If the state government and the federal government agree to those standards, then the people at the local level who are responsible for service delivery would be free to combine the available state and federal funds as they wish, and design the programs they think will be most effective in meeting those targets.
meeting those targets. They would continue to be free of the prevailing rules and regulations as long as they were meeting the targets they had set.

It is important to emphasize that we are not proposing a return to the old system of bloc grants. The option of combining funds from many sources and eliminating many of the rules and regulations that now apply (typical features of the bloc grant approach) would be available only to communities that were prepared to commit themselves to ambitious goals for their students, and they would be permitted to continue to combine funding sources and cut the red tape only if they were making steady and substantial progress toward those goals. This is not a proposal for deregulating the system. It is a proposal for changing radically the way the system is regulated, putting the emphasis squarely on performance.

We propose that Congress authorize the relevant Cabinet Secretaries to enter into negotiations with selected cities and counties with high concentrations of poverty following a competition among those communities and states that wanted to participate. To be successful, a proposal would have to demonstrate broad support from education, government, community and business leaders. The winners would be provided with agreements that would permit pooling of both state and federal funds in certain programs in exchange for commitment at the state and local levels to achieve high student outcomes.
This approach could go forward without any major reauthorizations of existing programs. It requires granting a general waiver authority to the Cabinet Secretaries to be used under conditions stipulated by the Congress. The Hawkins-Stafford School Improvement Act of 1988 contains some far-seeing provisions concerning negotiated agreements and dispute resolution processes upon which the required new legislation could be built.

To be of any value, these would have to be large-scale experiments, taking place in entire school districts. There are many existing examples of individual schools that are able to help their students function at high levels of performance, even in the poorest communities. But no school systems serving the kinds of communities that receive significant shares of federal funds for the disadvantaged have yet been able to produce consistent high performance at the levels that are now needed.

In each case, the recipient community would get a funding total based on the funds to which they would otherwise have been entitled had the normal rules been in place, plus an override in the neighborhood of five to ten percent, both as an inducement to take the risk of participating in this program and to cover the special costs that it will entail.

Here is how we see each of the five components of the restructuring program working.
THREE DESIGN PROGRAMS:

1. Design Program #1 (High Performance Schools) would be focused on the schools themselves and would permit participants to combine funds provided by the Chapter 1 Program for remedial education, the Education for All Handicapped Act, the Bilingual Program, the Magnet Schools Program and related state and federal programs. The districts would not be required to publicly identify the students who would otherwise be segregated into special classes.

The school districts involved in this program would be expected to engage in major efforts to restructure their schools for high performance. We include here the redesign of their organizational structure to push decisions down to the school level, new budget systems that give individual schools much more discretion over the way funds are spent, new salary and staffing systems that will enable them to attract and hold first rate teachers, streamlining of their administrative structures to reduce bureaucracy to a minimum and new accountability systems that provide real rewards to school staffs that are able to produce substantial progress for their students.

When it is possible to do so without exposing the vulnerable to injury, the districts would be encouraged to promote competition for clients among public schools, in the expectation that competition will produce better results at lower costs.

The outcome of this initiative, of course, would not only be sound specifications for the redesign of federal programs, but ideas the states could use for the redesign of
2. Design Program #2 (School to Work Transition) would be focussed on the school to work transition and would permit participants to combine funds from certain provisions of the Job Training Partnership Act (JTPA), the Vocational Education Act, the Adult Basic Education Act and other enactments focusing on dropout prevention at the state and federal level. This program and the next would be designed to breakdown current institutional barriers by providing strong incentives for the community to come together and provide coordinated service delivery systems. Participants would be expected to use those funds to involve school people and employers in the provision of job development, job counseling and high level academic and vocational skills in one integrated program. School districts and all providers of training services would have to agree to common academic and occupational competency standards for major occupational clusters and common performance standards. Employers will need to be deeply involved in the design and implementation of the program.

Here again, one outcome of this initiative would be the redesign of a whole range of programs that affect the school to work transition for millions of American youth. But, beyond that, the country would have vivid examples of communities that had managed to create local systems that match the effectiveness of those countries...
that are most successful at preparing their young people for direct entry into jobs that demand a high degree of technical skills and job readiness.

The Carl Perkins Vocational Education Act will come up for reauthorization this year. The reauthorization act should be given a strong performance orientation. Employers should have a strong voice in creating the standards by which program success is determined. Incentives should be created to force as much competition as possible among service providers, and no class of providers should be protected from that competition.

3. Design Program #3 (Social Service Integration) would permit a community to
develop integrated strategies for the use of funds that now go separately from state and
federal sources to education, welfare, social services, health, juvenile justice and child
protection agencies. It would permit and encourage development of bold new
solutions to the problems faced by low-income communities. States would have to take
a lead role in such an initiative because many of the rules governing such programs
are state-designed though the programs receive federal support. There again the
community would be expected to commit to negotiated standards for client outcomes
such as the reduction, for example, of teen pregnancies by a stated proportion, as a
condition of the right to pool program funds and waive certain program regulations.
Schools in communities participating in this program might become the site at which
many community services for youth are integrated.

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match the effectiveness of
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skills and job readiness.
TWO ADDITIONAL IDEAS:

4. A State Assistance Initiative will be essential to the success of any federal government program to restructure the schools for high performance. The states will have the primary role in determining student outcome standards, restructuring teacher education programs, raising the standards for licensing teachers, increasing the pool of minority teachers, providing technical support for restructuring and deciding on the form of statewide accountability systems, all of which will greatly influence the prospects for restructuring the schools.

For the last 25 years, the federal government has used the states to administer federal programs and enforce federal rules and regulations. It is time now for the federal government to recognize the leadership the states have displayed in recent years and to allow them some flexibility in using the assistance they now receive for federal program administration to develop and implement policies needed to support school restructuring.

We also propose that the Fund for the Improvement and Reform of Schools and Teaching (FIRST) be used to run a competitive program for state governments with two parts. Under the first part, it would provide funds enabling states to plan, design, implement and evaluate new policy systems that show substantial promise of greatly increasing the productivity of the state delivery system for education. In negotiated agreements that could be part of the grant awards, the federal government could
substantially reduce the burden of state and federal regulation on districts within the
state that agree to real consequences if their students fail to make acceptable progress
on state-defined student outcome measures for disadvantaged students. It would be up
to the state to propose the goals, the measures and the incentives, though the federal
government would have to agree to those standards. Under the second part of the
program, the states would also be eligible for modest financial assistance to help them
put in place the key elements required at the state level to make restructuring programs
for the professionalization of teaching work, including improved programs of teacher
preparation, new recruitment, licensing and induction systems for teachers and
principals; new accountability and incentive systems (including public choice plans
and performance incentive plans); and new leadership development programs for key
personnel at all levels of the state and local structure.

5. More Emphasis on Statistical and Educational Research. The federal govern-
ment's investment in national statistics and educational research must be increased if
the restructuring program is going to succeed.

The budget of the National Center for Education Statistics (NCES) should be
increased substantially. The Center should be given a mandate to measure the
attainment of people in the workforce, and to develop a new assessment of what
college students know and are able to do. The Center should also be asked to enter into
negotiations with other countries to conduct regular assessments among the industr

that agree to real consequences if their students fail to make acceptable progress on
state-defined student outcome measures for disadvantaged students.

...the states would also be eligible for modest financial assistance to help them put in place the key elements required at the state level to make restructuring programs for the professionalization of teaching work.

The creation of performance-based systems will require the existence of a whole range of tools that do not now exist, but the overriding need is for new measures of student and teacher performance.

Research and development assumes a special, even decisive, importance when the object is not just making marginal improvements in the existing system, but seeking to replace the existing system with one of a new design. The creation of performance-based systems will require the existence of a whole range of tools that do not now exist, but the overriding need is for new measures of student and teacher performance. Teachers, for better or worse, teach to the test. Because the current tests do not measure higher order thinking skills or do so very badly, the skills that are being taught are the ones that are being measured rather than the ones the country needs to have taught.

It is essential that valid, reliable and affordable assessments of a whole range of higher order thinking skills be devised and made available to the states and the schools as soon as possible. We must be able to measure how deep the understanding of physics goes and how well the student can draw on that knowledge to solve complex, real world problems. We need effective ways to assess not just whether high school seniors can read a bus schedule, but whether they can write a memo to a shop floor supervisor that analyzes a production problem involving complex machinery and recommend a solution.
Similarly, it is important that good measures of teacher performance be devised, making it possible to license and certify teachers according to high standards of professional performance. We support the request of the National Board for Professional Teaching Standards for matching funds to develop such assessments.
MAKE THE UNITED STATES PREEMINENT IN
SCIENCE, MATHEMATICS AND TECHNOLOGY

1. Declare a Goal.

The President should declare a goal of matching the mathematics and science performance of students in all other countries by a date certain and create a cabinet council to devise a national strategy for doing that, in concert with the science community and the science education community. The strategy should build on the effort of the American Association for the Advancement of Science (AAAS) to broadly involve the science community in providing new guidelines for the science curriculum, and on the parallel effort of the Mathematical Sciences Education Board of the National Academy of Sciences to do the same for mathematics.

2. Develop New Curriculum Resources.

When the preliminary work these groups are now engaged in is done, a new science, mathematics and technology curriculum development effort should be announced, designed to engage the country's most talented mathematicians, scientists, engineers and teachers in a determined effort to produce curriculum materials and teaching materials that will support the teaching of challenging technical curricula not just to a
small elite, but to the vast majority of American students. This program should be complemented by an even larger effort to improve radically the quality of mathematics and science teachers and teaching, especially in the elementary grades.

For decades, the United States has repeatedly created astonishing technologies that have changed the world. But we have yet to make a serious effort to apply our technological genius to education, to the problem of inspiring a bored generation of students with the essential curiosity that learning requires.

3. Build a National Communications Highway for Education.

The administration should announce as soon as possible its commitment to engage the talents of the military and the high technology business community in the construction of a national communications network that could be used by students of all ages for the delivery and exchange of television and computer-based instruction and information. The availability of such a system would undoubtedly be comparable in impact to the federal highway system developed by the Eisenhower administration, leading to an explosion in the development of new software more imaginative and effective than any that now exists.

... improve radically the quality of mathematics and science teachers and teaching.

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4. Create a Laboratory of Networked Demonstration Schools.

At the same time a new program should be announced, creating a network of schools around the country that will be laboratories and demonstration sites for the application of advanced information technologies to education. It is very unlikely that the rates of improvement in the quality of education we earlier suggested are necessary can be achieved without the creative use of technology in restructured schools. Teachers, no matter how good, will be unable to coach students to reach their highest potential unless we figure out how to let the technology take over much of the task of purveying information. Students are likely to be much more engaged when they can explore the kinds of intellectual environments that advanced information technologies can create.

5. Design a National Program to Teach Teachers Technology.

Finally, the states should be used to design a national program to train teachers to use these new technologies effectively. A recent survey shows that even the computer specialists in the schools doubt their own competence with computers, to say nothing of the much larger number of teachers who are not among the specialists but who will have to feel comfortable with a broad range of technologies in order to make them effective.
PROVIDE OUR WORKERS THE SKILLS THEY NEED TO COMPETE

Our education system has concentrated on the front end: elementary and secondary education and traditional postsecondary education. All our systems are set up to concentrate resources on those who get what they need in a smooth progression through that system. But millions have fallen through the cracks. Some, illiterate and barely literate, hang out on street corners, unable to get a job. Many others, some in our most prestigious firms, cannot read at a fourth grade level. Many more, including some in the top technical ranks, are far behind their counterparts in other countries in the skills they bring to the job. The supply of young people coming into the workforce is dwindling as the number of old people depending on the shrinking population of workers is rising. The only way to maintain our standard of living under those conditions is to greatly increase the skills of every person who is out of school and available for work. That will require a massive reorientation of policy.

In the arena of elementary and secondary education, we have advocated building on a reform movement already underway, to strengthen and confirm an
approach already pioneered by the states. But, we must address areas where the challenge is not to consolidate gains but to galvanize the nation to action.

1. Adult Illiteracy.

The country has yet to take the problem of adult functional illiteracy seriously. We continue to treat it as a personal misfortune rather than as the threat to the nation's standard of living that it really is. We continue to make believe it can be solved through a volunteer campaign, when we would never dream of turning the education of our children over to volunteers, although the end to be achieved is the same, to provide for adults what they never got in school, a task which is often more difficult to accomplish later in life than earlier.

Whether we speak of the problems of a young, unemployed person who may not be able to read at all and has never held a job other than as a casual laborer, or of a middle aged front line supervisor who makes good money but reads and cipher at a fourth grade level, or an engineer who is twenty years out of date in his field, we are speaking of millions of Americans whose skill levels will be more critical to this country's success between now and the end of the century than the students now in...
out of date in his field, we are speaking of millions of Americans whose skill levels will be more critical to this country's success between now and the end of the century than the students now in school or the students in our colleges.

School or the students in our colleges. Yet this country, which spends as much or more on education as any other country in the world, spends comparatively little on its adult line workers.

Attention must be paid to strengthening the second chance system for those who did not get a basic education in school and who are, as a result, living on the economic and social margins of our society. Employers cannot be expected to pay the whole bill to educate these people, because they cannot recapture their investment if they do, since the person in whom they make that investment can walk across the street and sell those general skills to another employer who makes no effort to provide a basic education at all. The funding of these programs is vanishingly small in relation to the burgeoning need.

2. Higher Levels of Workforce Training.

Some nations with which we compete have long established corporate cultures that support high levels of private expenditures to address some of these problems for some of the members of the workforce. Others rely on various forms of tax abatements to finance these functions where others rely on taxes to raise very substantial revenues for direct government expenditures for the same purposes. We should explore all of these options and construct a policy for the United States that suits our needs and cultural and political character.
CONCLUSION

Twenty years ago, almost everyone looked to the federal government for leadership in education policy. More recently, the states have once again become the nation's laboratory as the federal government stepped into the background. It is time now for the pendulum to stop its swing in the middle. The fundamental changes that are now needed will not come about unless every part of the intergovernmental system works at peak performance and works in harness with the others. That will take real leadership—from the President and the Cabinet, the Congress, governors and other state leaders, business executives, the national organizations with a major stake in education policy and, hardly least, the people in our local communities who must make it all work 'on the ground.'

Years ago, this country led the world in the abundance and quality of its natural resources. That is no longer true. Today, we are all we have. Our country's real resources lie within each one of us, whether the challenge is our ability to compete in world commerce or to govern ourselves. More depends on education than ever before. We believe there is no constraint standing in the way of dramatic progress in this arena that will not yield to imagination and commitment. Not the least of our purposes in presenting this report has been to offer a framework for policy making that we believe will enlist both in large measure from the American people.
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