



OFFICE OF THE VICE PRESIDENT

WASHINGTON  
January 8, 1997

MEMORANDUM FOR THE PRESIDENT  
THE VICE PRESIDENT

FROM: GREG SIMON  
JIM KOHLENBERGER

SUBJECT: CABINET RETREAT BRIEFING:  
EDUCATIONAL TECHNOLOGY

OVERVIEW

The Clinton Administration has made an unprecedented commitment to bringing technology into the classroom. As a central element of the President's lifelong learning agenda, the Administration believes that technology can help expand opportunities for American children to improve their skills, maximize their potential, and ready them for the 21st century.

In order for us to ensure that all our children have their shot at the American dream, we need to empower them with the technological literacy they'll need to succeed in a new and ever-changing information economy. By 2000, 60% of the new jobs in America will require advanced technological skills. Unfortunately, only 20% of our workforce possesses these skills today.

We have a long way to go. While our workplaces are moving swiftly into the information age, our classrooms are not keeping pace. While our economy is moving swiftly from an industrial to an information economy, our schools too often resemble the assembly line mentality of the industrial age. Today, millions of children have more contact with technology in an afternoon at the video arcade than they do all year in school. We need to change that. We need companies to develop software that is as exciting to learn from as video games are to play. We need schools equipped with the right technology. *We need teachers who are fearless users of technology.*

If we fail to ensure that all our children are technologically literate, our nation will be poorer economically and spiritually. We will allow our nation to face a new divide -- the divide between those children who have access to technology and those who never have.

That is why the President and Vice President have called on parents, teachers, leading CEOs and others to join us in a new national mission -- to make all children technologically literate by the dawn of the 21st century, equipped with the skills essential for the Information Age.

## LEGACY OBJECTIVES

The President and Vice President have laid out four key objectives:

- **Connections.** Connect every school and classroom in America to the information superhighway by the year 2000. *Connections to networks, especially the Internet, multiply the power and usefulness of computers as learning tools by putting the best libraries, museums and other research and cultural resources at our students' and teachers' fingertips. Only 9 percent of classrooms are now connected to the Internet.*
- **Content.** Develop effective and engaging software and on-line learning resources as an integral part of the school curriculum. *Software and on-line learning resources can increase a student's learning opportunities, but they must be high quality, engaging and directly related to the school's curriculum.*
- **Computers.** Provide access to modern multimedia computers for all teachers and students. *Computers become effective instructional tools only if they are readily accessible by students and teachers. Only 4 percent of schools have a computer for every five students (a ration deemed adequate to allow regular use.)*
- **Professional Development.** Provide all teachers the training and support they need to help students learn through computers and the information superhighway. *Upgrading teacher training is key to integrating technology into the classroom.*

Research and the experiences of schools in the forefront of the current "digital revolution" underscore the enormous learning opportunities available through technology.

## ACHIEVING THE OBJECTIVES

To reach these objectives, the President and Vice President have announced and identified a series of programs and efforts targeted at educational technology.

- **America's Technology Literacy Challenge.**  
Last year, President Clinton asked congress to fund a \$2 billion, five-year Technology Literacy Challenge designed to catalyze state, local, and private sector partnerships in each state to achieve achieving the four education technology goals. Congress supported the President's request and appropriated \$2.57 billion in the omnibus bill for FY97 to launch this challenge. States will be asked to develop a strategy for using the funds to achieve the President's four goals and for ensuring that students in

T. Literacy  
Challenge  
13  
• FUND - 200 million  
• GRANTS - 57 million

200 million  
per  
state

technology needed to link classrooms, libraries, and laboratories to the information superhighway. This effort sparked an enormous response around the nation and this last fall all 50 states hosted NetDay events which will bring the nation dramatically closer to our goal of connecting all classrooms to the net by the end of the decade. We have made 1997 NetYear with another series of Netdays taking place across the country on April 19th.

- **Connecting Schools in Empowerment Zones**

Last year the Vice President announced an initiative that will connect every school in every Empowerment Zone in the country to the information superhighway. A number of information industry leaders have joined together to provide Internet accounts. The President issued an Executive Order targeting federal excess and surplus computers to Empowerment Zones. Additionally, private firms sponsored a truck loaded with computers, engaging software, and instructors which traveled to every empowerment zone last summer helping expose the communities to the power of the new technology and helping teachers prepare to use the equipment being installed. This program means that every child living in one of the 15 urban and rural Empowerment Zones will be able to connect to the Internet -- and students and teachers in these Empowerment Zones schools will be able to connect to each other.

- **21st Century Teachers**

The new technology can't make much of an impact on learning unless teachers help find creative new ways to exploit its power and make the new tools an integral part of their teaching. The teachers, and the organizations that support teachers, all have stepped forward to work together to meet the president's challenge. The National School Boards Association, the National PTA, the National Education Association, the American Federation of Teachers, and many other professional and business organizations have launched this initiative which hopes to recruit thousands of teachers who will volunteer to enhance their own understanding of how to use education technology and share their expertise with others.

- **Tech Corps**

The President announced the creation of the Tech Corps -- a national organization of private sector volunteers with technological expertise dedicated to improving K-12 education at the local level. Tech Corps was launched as a private-sector response to the President's national mission. Its purpose is to recruit, place, and support volunteers from the private sector to advise and assist schools in integrating new technologies into the classroom. Official Tech Corps chapters have been formed in 35 states plus the District of Columbia. Tennessee has a very active chapter with many volunteers from the Knoxville area.

low-income areas are not left behind. While the states will have complete freedom to design programs, they will be asked to find support from private firms which will be at least as great as the Federal funds requested. They will also be asked to specify timetables and benchmarks and to report progress against these benchmarks to the people of the state annually. ~~The President's commitment to the people of the state is to ensure that every child has the opportunity to succeed.~~

- **Corporate Commission on Educational Technology.**

One of the primary components of the President's educational technology initiative has been private sector involvement. For example last October the President and Vice President announced a corporate commission on educational technology. CEOs of some of several the nation's largest, and most innovative telecommunication companies have joined together on this commission to help meet the President's vision. Sumner Redstone will act as Chairman and Lynn Forrester as Vice Chairman of a new organization that will reach many other CEOs willing to work in partnerships with states and school districts.

- **Universal and Affordable Access to Advanced Telecommunications**

When President Clinton signed into law the Telecommunications Act of 1996, he helped ensure that all schools and libraries have affordable access to advanced telecommunications services. A Federal-State Joint Board established by the Telecommunications Act recently said carriers should discount their services between 20% and 90% when providing them to schools. The unanimous recommendation now goes to the Federal Communications Commission, which must decide by next May on the recommendation. The board's proposal would make available \$ 2.25 billion per year, which would come from an existing fund paid for by telephone companies to support universal telephone access. In addition to discounts for the Internet service itself, schools would be given discounts on the costs of hooking them up to telecommunications networks necessary to tap into the Internet and on the costs of wiring inside classrooms. Other than for the most affluent schools, discounts would range from 40 percent to 90 percent, depending on the wealth of the school and whether it is in a high-cost telecommunications area such as a rural community. Cut rates also would be available to libraries.

- **NetDays**

The President and Vice President brought together information industry leaders on September 21, 1995, to launch a historic effort to connect classrooms in at least 20 percent of California's schools by the end of the year. The initiative, called NetDay96, is a volunteer effort by California companies, universities, parents, teachers, and engineers to install internal wiring in California schools. On March 9, 1996, the President and Vice President and more than 20,000 volunteers laid 6 million feet of cable connecting thousands of California schools with the

- **Grants to Schools Through the Telecommunications and Infrastructure Assistance Program (TIAP)**

The Clinton Administration created the Department of Commerce's Telecommunications and Information Infrastructure Assistance Program (TIAP), which makes grants to public institutions to speed the flow of information through the application of advanced communications technology. TIAP has accelerated the pace of connecting public institutions and has stimulated significant private sector investment. This program has enabled the federal government to leverage \$24.4 million in federal funds to provide a total of \$64.4 million in cutting-edge demonstration projects for public institutions.

- **Connecting Students to the Environment**

The Vice President initiated the Global Learning and Observations to Benefit the Environment (GLOBE) Program in 1994. GLOBE joins students, educators, and scientists in an international science and environmental education network using state-of-the-art technology. GLOBE students make environmental observations at or near their schools and share their data through the Internet. More than 2,000 schools in the U.S. participated in GLOBE in 1995.

- **The Technology Challenge Program**

In order to help spur innovative content development, this administration created the Technology Challenge Program. This program invites school systems, colleges, universities, and private businesses to form partnerships to develop creative new ways to use technology for learning. These local innovation grants focus on integrating innovative learning technologies to improve teaching and learning. Each federal dollar is matched by more than 3 to 1 by local and private funds. The 19 consortia funded last year are reaching schools with 1.2 million students and involve partnerships with businesses, museums, libraries, and parks in school systems around the nation. These 19 programs will be continued and an additional 24 partnerships have also been funded. The new partnerships will allow 24 school districts to work in partnership with a total of 153 other school districts and 130 businesses in 34 states. *A total of \$47 million has been awarded (\$9 million in 95, 38 million in 96). By this spring an additional \$58 million will support a third round of 5-year grants.*

### CHOICES AND QUESTIONS

- How do we do a better job at bridging the gap between the information haves and have nots?
- How can we make better use of the expertise and resources of a broader range of cabinet agencies in meeting the core objectives?
- — How do we better connect the issues of educational technology, school reform and basic school infrastructure?
- How can we bring the President's challenge on educational technology to

- every school room, corporate board room, teacher's lounge and dining room table?
- How do we address the concerns of those schools who say that they have more important concerns than technology, collapsing buildings, heating problems, textbook shortages, crime etc.?
- How do we ensure that educational technology actually becomes an important part of the curriculum and rooted in learning?
- As advances in technology race ahead, how do we ensure that our children keep up?

## 7.7 Additional Bullet-

Third annual survey of Advanced Telecommunications in K-12 schools.

Survey will show that we are continuing to make real progress in connecting schools and classrooms!

However, it will also show that schools with high percentage of poor and minority students, and schools in most rural areas (smaller schools) lag behind! The survey will also show that teachers are more likely to have to find "help" to use the technology on their own!

It will also show that private sector efforts like Tech Corps and NetDay are making a difference.

Draft May 28, 1998

MEMORANDUM FOR THE PRESIDENT

FROM:

RE: MIT COMMENCEMENT ADDRESS -- UNIVERSAL INFORMATION  
TECHNOLOGY LITERACY

**Summary:** We believe that you should use the MIT commencement address to set a national goal of universal information technology literacy by the time students leave middle school. We think there is a strong case to be made that this is a "new basic." To be full participants in the information economy and information society - our children need to be able to use information technology to acquire and synthesize information, prepare for a life-time of learning, and collaborate in the technology-intensive workplace of the 21st century. Information technology can also be a powerful tool for teaching and learning in all academic subjects.

As of 1996, 10 states have already established some sort of requirement in this area - although most require a course or demonstration of competency for high school graduation.

To strengthen this initiative -- we also believe that you should:

- Provide states that join with you to meet this goal with the resources to train a team of technology experts in each middle school - who could in turn help train the other teachers (\$180 million over three years); and
- Provide funding for our leading universities and software companies to develop compelling educational software that would cover the entire middle school curriculum (\$81 million over three years);

Your vision of universal IT literacy needs to be broader than the traditional definition of "computer literacy" - which has tended to focus on the basic skills required to use a computer and a few computer programs, such as a word processor or a spreadsheet. This is necessary but not sufficient. For example, students need to be able to effectively use information technology to locate, extract, and synthesize information from multiple sources. They need to be able to use information technology to learn and express key concepts in all academic subjects - such as math and science.

## **Why should you call for universal IT literacy?**

### **1. Information technology can be a powerful tool for teaching and learning in all academic subjects**

IT literacy is not just an end in itself. The rationale for your Educational Technology Initiative is that information technology can be a powerful tool for teaching and learning across the curriculum. Students who are IT literate and who have access to technology are able to:

- Engage in project-based learning - such as collecting and sharing environmental information with students and scientists all over the world;
- Conduct research using primary material;
- Learn at their own pace, and get immediate feedback on whether they understand a new concept by using interactive courseware.

### **2. Many high-wage jobs now require IT skills:**

- There is already a 10-15 percent wage premium for people who know how to use computers as compared to those who don't.
- Jobs in the information technology sector pay \$48,000 per year, as compared to a private sector average of \$28,000.
- Information technology is increasingly pervasive in all industries. Many firms are using information technology to customize products and services, forge closer relationships with customers and suppliers, and slash the time required to develop new products. A machinist, for example, may need to know how to operate a programmable machine tool.
- Although there is some debate about the exact numbers, many high-tech companies report that they cannot hire enough workers with IT skills, and that this is their number one constraint on growth.

### **3. Being IT-literate will allow people to be full participants in the emerging Information Society:**

Information technologies are becoming so pervasive that people who are IT-literate will have more opportunities and will be able to make better choices -- as workers, parents, voters, consumers, owners of small business, and members of local communities.

People who are IT-literate are able to:

- Be better consumers of health care by finding out what others are saying about the quality of care they are receiving from HMOs or individual physicians;
- Track the voting record of their member of Congress on issues they care about -- or get more information on a policy issue than the 30 second soundbite on the evening news;
- Tap in to an EPA database to find out what corporations are dumping toxic substances into the local environment;
- Work from home - or use the Internet to sell the products and services of their own small business;
- Log on to the web site of their local school to find out what homework their children are supposed to be doing, communicate more frequently with their children's teachers, and compare how their school is doing relative to other schools;
- Use "intelligent agents" to get the best price on a new car or a family vacation;
- Acquire a new skill to compete for a higher-wage job by participating in a "virtual university"; and
- Learn and adapt to future waves of technological innovation.

#### **Proposed Administration "vision" for universal IT literacy**

- States should establish universal IT literacy as a requirement for middle school graduation.
- This is a "new basic" - but it clearly rests on a foundation of other basic skills. Obviously, knowing to send e-mail or browse the Web is worthless without knowing how to read and write effectively.
- Being IT literate is about more than knowing how to turn on a computer and use a few computer programs. It requires demonstrating the ability to:
  - Use technology effectively as a tool for learning in core academic subjects;
  - Locate and synthesize information from multiple sources;
  - Communicate and present information effectively using electronic media; and
  - Collaborate in teams using information technology.

- The Administration will work with states, educators, and employers to develop a consensus on the important elements of IT literacy -- building on the experiences of states and local school districts that have been leaders in this area.

### **Technology training for teachers**

Students will have a difficult time becoming technologically literate unless their teachers are as comfortable with a computer as they are with the chalkboard. As you noted in a speech you gave last year, "I met with a group of young people yesterday in their 20s who said .. 'What difference will it make if you connect every classroom in the country to the Information Superhighway if the teachers aren't trained to use the technology and the kids know more than they do?'"

We think that it would make sense to provide states that set a goal of universal IT literacy with the funding to train a team of technology experts in each middle school - who could in turn help train the other teachers.

We estimate that the cost of this would be \$180 million over three years - \$30 million in the first year, and ramping up to \$90 million in year 3 as all states establish universal IT literacy as a goal.

Schools would use the money (\$20,000 over three years) to:

- Provide intensive training during the summer to a team of teachers in each school; and
- Provide follow-up training and release time so that these teachers can help train other teachers.

[Assumptions:]

- There are 13,000 middle schools.
- The grant per school is \$20,000 over three years - which is sufficient to train a team of teachers plus follow-up training plus release time.
- One-third of the states accept the President's challenge in the first year -- all do by year 3.

### **Educational software**

You could also use the speech to challenge our leading universities (such as MIT) to join with software developers to develop high-quality educational software. Many more of the nation's top computer programmers who graduate from schools like MIT work on video games like Mortal Combat than work on educational software!

For \$81 million over three years, the Administration could provide \$3 million grants for

multiple software development teams in each of the subjects in the middle school curriculum.

These competitive grants would:

- Be limited to the Math, Science, and English in the first year;
- Expand to the rest of the curriculum (e.g. social science, IT literacy, foreign languages) in the second and third-years;
- Leverage the best minds and creative talent in our leading universities and software developers; and
- Encourage the development of software and Internet-based resources that meets TIMSS and other standards in core academic subjects.

### Discussion

#### **Pros**

- Universal IT literacy is clearly an important national goal. Achieving this goal will help students improve their academic performance, prepare them for the workplace of the 21st century, and enable them to be full participants in the emerging Information Society.
- Even those parents who have a sense that technology has passed them by definitely want their children to participate in the Information Revolution.
- This initiative would also make progress on teacher training and educational software.

#### **Cons**

- It may be difficult to communicate that the Administration is promoting something that goes beyond the traditional, narrow definition of "computer literacy."
- The proposal could get caught up in the politics of the national standards debate.
- Would require making a decision on the FY2000 budget before the budget cycle.
- We would be adding additional resources to technology training for teachers before we know whether the Congress has appropriated any funding for your FY99 proposal.

#### **Views of your advisors**

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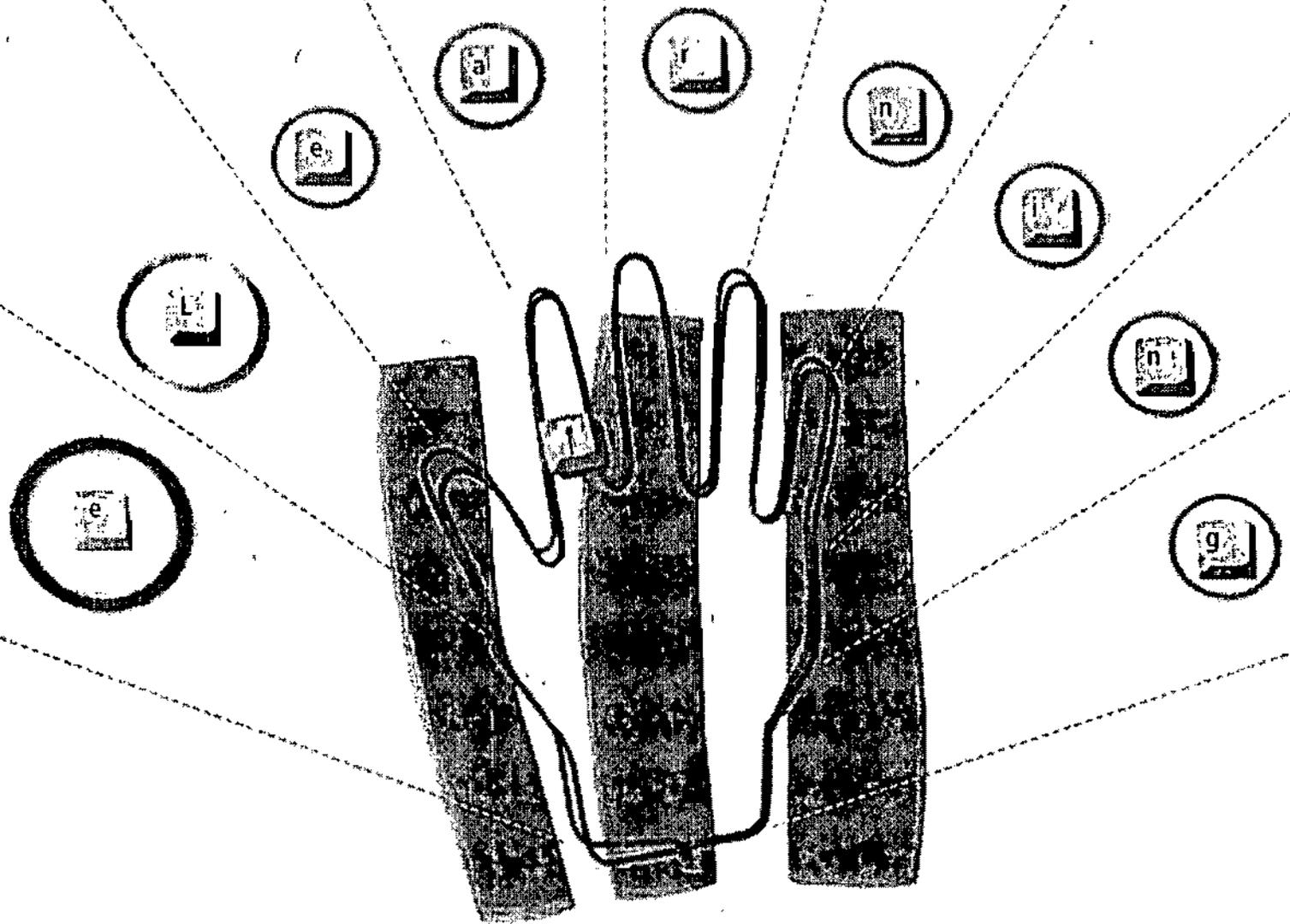
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