

THE WHITE HOUSE
WASHINGTON

August 17, 1993

MEMORANDUM FOR BONNIE DEANE, DAVID ELLWOOD, ED FITZSIMMONS, LARRY
KATZ, TOM KALIL, DOUG ROSS, AND MIKE SMITH / LINDA ROBERTS

FROM: PAUL DIMOND

SUBJECT: EFFECTIVE INVESTING IN LEARNING

Attached are two brief papers for discussion: the first on increasing the productivity of learning, the second on financing life-long learning. Subject to conflicts in schedules, could you join me for a lunch as my guest at the White House Mess on Wednesday, September 8 at noon, and a one-hour seminar as my sympathetic critics for rethinking how to invest more effectively in people learning.

Please call my assistant Nicole Lindsay at 456-2800 to confirm. In the meantime, if you have any comments, suggestions or questions, fire away.

cc Bo Cutler

*Nicole + Linda
Close in by
Sunday*

ASKING THE RIGHT QUESTIONS ABOUT EDUCATION, SCHOOLING AND TRAINING?

BACKGROUND:

1. The discussion about reforming education, schooling and training in this country focusses on improving the quality of the teachers, the organization and responsiveness of the schools, and the curriculum; lowering class size; integrating more services; raising standards for teacher and student performance, etc. The focus is improving the means of schooling, education and training—whether in adding a year to head start, expanding head start to cover all eligible children, improving k-12 education or training for school-to-work, welfare-to-work, dislocated worker-to-work, or career transitions. Even those who tout choice and market mechanisms as an alternative speak primarily in terms of improving the means of schooling.

2. This focus on improving the means of production—seen as education, schooling or training—has not led to any measurable increase in the efficiency of schooling this century. Yes, we have had major increases in the numbers of students who attend K-12 and graduate from high schools in this century, as we have made schooling universal. Yes, we have made progress in providing some increased portion of eligible pre-school children with a Head Start, as funding has gone up. But all of these improvements have been incremental not exponential: as we add schools and centers for care or training, as we add teachers and providers, as we add resources, there is sometimes a proportional increase in the numbers of persons trained, schooled or nurtured.

3. Compared to virtually any other industry in the twentieth century, education has had at best minimal gains in productivity. Consider that we grow and distribute more and better food today at a lower cost with only a fraction of the farmers that tilled the land at the turn of the century. We build better products, more efficiently, on a much more customized basis, with less environmental pollution, and with far fewer workers per unit of output than at the turn of the century; and, where we are not as efficient, responsive, and effective, we lose production overseas. We have whole new industries—entertainment, information, services—barely imagined at the turn of the century. We have an increasing variety of new technologies that have revolutionized industries, old and new alike, and that are remaking our nation and the world as a new economy unfolds all around us. Yet education, training, and schooling look, act, and produce much the same way they did at the turn of the century.

THESIS:

IT'S LEARNING, STUPID!

In a Layer of Riches, Joel Mokyr begins:

Technological creativity, like all creativity, is an act of rebellion.

We need to consider whether such an act of rebellion is essential if we are to transform the skills of all of our people. We need to consider whether we are on the cusp of a technological revolution that will enable us to choose a new direction.

Consider three, related shifts in thinking:

1. It's Learning: Let the Learning Lever Begin. It is learning—not education, training, or schooling—that is at issue. From this perspective, the major problem is that we know that every person is different and unique. If we could invent efficient and effective means of learning, therefore, we would not be satisfied just by finding the common needs of most learners. Instead, we would try to customize the means of learning to serve each learner and to allow learners to proceed at their own pace, in their own styles, including by working at learning with one another in pairs or larger groups, as well as alone. Howard Gardner, and others, have begun to speak to such a different conception.

Such a reinvented vision of learning might seem to depend on having a wide variety of tutors for virtually every learner. Yet the primary work is done by the learner, not by the tutor. As a result, we can begin to imagine a system where the learner connects up with tutors at various times, but can also do much of the work of learning on her own (or, together, with peers and parents). What would be most helpful to such a reinvented system of learning are a wide variety of levers to assist the learner (and peers, parents and tutors) along a wide variety paths to learning. We, therefore, call these new tools: Learning Levers.

2. It's technology: Let the Rebellion Begin. For such a learning revolution to succeed, of course, we will need a technological revolution as well. And, one is on the horizon if not already upon us. To date, most computers have been linear—yes-no, stringing words and bits together in a line, computing numbers, most triggered by a numerical/alphabetical keyboard or a mouse. But images, sounds, non-linear information and insights, rolling frames and stop action, interactive multi-media are all coming together. Miniaturization, compacting of data, new means of transmitting images, sound and information, and so much more are upon us. The potential for creating all variety of Learning Levers is a rebellion in the making.

3. It's Interactive Entertainment: Let The Games Begin. Finally, the smashing rebellion is that the real variety (and payoff) is not in the hardware or the systems software of Learning Levers: it's in the content, the program, the entertainment, the production of the plays and the provision for the interactions. Current estimates are that 1% of the revenues, profits, and jobs are in making the hardware, up to 4% in the systems software, and something like 95% in the content. Imagine if CD's, games, entertainment, interactive multi-media, and all manner of engaging content all came together with the revolution in technology and a revolution in learning!

As an added bonus, here is a burgeoning new industry where the U.S. has a competitive edge on the rest of the world. If the 21st Century is to be an American Century as Ben Wattenburg argues, Learning Levers could be one of the major keys to translating what he assumes is our current cultural dominance into a major economic advance. Learning Levers could become the means to revolutionize learning—for all ages—in America, and around the world. Learning could become the biggest growth industry of the new information age: non-polluting, creative,

entertaining, creating thousands of new products and markets, millions of jobs, while serving the needs of learners of all ages everywhere.

So, how does such a vision inform our review of policy?

- We should explore how we can create an environment where such a revolution can proceed apace in a democratic fashion. We should make sure that Chapter I, Head Start, Apprenticeship, dislocated worker, other transitional training, and family assistance include some provision for allowing persons in need full access to Learning Levers.
- We should be cautious about betting all of our programs and dollars on improving the old means of education, training, and schooling.
- We should invest some of our programs and dollars in demonstrations of Learning Levers.
- In setting standards, we need to make sure that they are receptive to achievement through the use of learning levers
- We may need to rethink how we organize Healthy Start, Head Start, K-12, transitional training so as to be open to a greater variety of means of delivering services. States, localities, and public and private providers may all be affected dramatically.
- We may want to consider how far along such a revolution in learning may be, and what we can do to nurture it, including by creating a hospitable and rewarding intellectual property environment.
- We ought to begin planning for a major learning conversion with all variety of teachers, trainers, educators, nurturers, and other public servants.
- We should consider whether President Clinton could use his bully pulpit (and make available the existing resources of our government) to call on the private sector to make Learning Levers one of America's major contributions to the twenty-first century. For example, a national competition could be conducted annually to award the Presidential Prize for the most innovative Learning Lever for early childhood, childhood, early adolescence and adolescence, young adult and adults; for families, schools and libraries of the future, career transitions and lifelong learning; for interactive and portable learning games for the home, school, work and new, one-stop learning and career centers; etc.

Joel Mokyr documents that, over the centuries, major technological advances have provided what most economists fail to comprehend: a veritable "free lunch" in economic growth -- but only for those societies smart enough to embrace the new innovation and to withstand the inevitable dislocations as the means of production change and the pre-existing equilibrium is disrupted. Learning Levers offers our country such a Lever of Riches -- but only if we are smart enough to seek the liberating prize of learning for life for every person and bold enough to embrace the economic reward of constant personal, family, and community renewal.

ASKING THE RIGHT QUESTIONS ABOUT FINANCING LIFELONG LEARNING?

1. Federal financing of post-secondary education and training is now premised on a hodge-podge of programs and separate funding streams, e.g., for apprenticeship and student loans from DoEd, Job Training Partnership Act from DOL, JOBS from HHS, etc. With the exception of the revised student loan program, all are premised on the federal government (often in partnerships with the States) funding post-secondary education and training from current appropriations for grants to individuals or to providers. This means that the recipient of the education and training service is given a hand-out by current taxpayers and has no obligation to share in any resulting increase in earnings; and, given current budget constraints and competing priorities, there is virtually no room for meaningfully increasing investments in people's learning after secondary school.

2. The National Service Trust offers the beginnings of an alternative mechanism for financing education: income contingent loans to students. If structured properly under federal credit reform, the only impact on the current federal budget of such direct federal loans or guarantees is the total present value of (a) any federal subsidy in the interest rate, (b) any guarantee, and/or (c) any projected defaults on principal and interest repayments. (In addition, the direct federal loans are a debt owing to the U.S. government and, therefore, can be collected directly by IRS through withholding taxes and annual tax returns and can be subject to other collection procedures and penalties if not paid.) This means that the recipient of the education and training service financed by the federal government has an obligation to share in any resulting increase in earnings; and there is no budgetary limit on the amount of investments that the federal government may make available to qualified individuals who choose to borrow to invest in their own learning to increase their future earnings potential.

3. In a world where the means of production and the nature of work, employment, and firms are so rapidly changing, we need to find a fiscally responsible, administratively feasible, and economically sound means to finance learning for all interested persons throughout the lifespan that fits our culture and maximizes our potential. Given the lack of evidence that any particular form of post-secondary education or training is particularly well-suited to provide the necessary opportunities for meaningful learning throughout the lifespan in the turbulent decades ahead, why not empower each qualified individual to invest in his or her own future? In a nation where federal and state budget constraints do not permit government to spend more for lifelong learning, alternative means of financing must be found. Is there any better way than for the federal government to establish a means to finance the opportunity for every individual to take responsibility for investing in their own future, learning what each individual will find most rewarding through out his or her own life, and repaying that investment through a share in their own lifetime earnings?

THESIS:

Not only is it lifelong learning, stupid!
It's also stupid not to have
the primary beneficiary of learning pay for it,
particularly when no one else has as much stake in the outcome.

A Universal Personal Lifetime learning Trust could provide the means to finance lifetime learning through direct, income contingent federal loans to all interested and qualified learners. First, UPLIFT would substitute direct loans to qualified post-secondary learners at any time in their life for the plethora of current federal training and education programs and bureaucracies that seek to provide education to some for a college education and job training for a few to transition from one job to another or from welfare to a job. UPLIFT would permit the financing of all lifetime learning, without regard to current federal, state or local budget constraints: we could put people first by empowering them to invest in their own learning throughout their lives.

Second, UPLIFT would place the responsibility for paying for learning on those to whom it matters the most — the learner who will get out of the education experience only what he or she puts into it. The supply of learning experiences would then be driven by what the whole host of learners demand, not what current providers offer or what any government believes is the next wave of the future. Rather than bet on the interlocking webs of firms with lifetime employment as in Japan or on the federally mandated, public-private training and central bank financing of business as in Germany, UPLIFT would encourage all of our people to invest in themselves and in our future through taking responsibility for their own learning in tens of thousands of public, private, for-profit and non-profit, on-campus and remote learning experiences throughout their lives.

Finally, in addition to stimulating demand for learning and supply of diverse learning experiences, UPLIFT would also stimulate a variety of private market alternatives to finance one or another niche in lifelong learning. Market safeguards could be included to assure some quality control: for example, requiring providers of learning experiences to disclose costs, short-term outcomes, long-term value added; sanctioning providers who misrepresent or leave a trail of participants who default on their income-contingent repayment obligations; or encouraging independent evaluation, grading, and reporting of the results of providers' services. What a shock it might be to all of our preconceptions to prove what we now only tout: that investment in human capital — i.e., learning — pays a market rate of return.

In sum, UPLIFT would provide a real legacy from the Clinton-Gore Administration to future generations — the federal government using its financial muscle, with both smarts and prudence, to finance the opportunity of all persons to take responsibility for investing in their own learning for life!

THE WHITE HOUSE

WASHINGTON

February 9, 1994

MEMORANDUM FOR DAVE BARRAM
HENRY KELLY

FROM: PAUL DIMOND
BONNIE DEANE
TOM KALIL

SUBJECT: LEARNING TECHNOLOGY R&D

GOAL. Our goal over the next several weeks is to answer the following questions:

Can the Administration's relevant federal R&D programs (e.g., TRP, ATP, NTIA, DOEd Technology, DOL Labor Market/One Stop, NSF, NIE) play a role in stimulating, seeding, or otherwise fostering a new learning industry?

If the answer is yes, what is the nature and scope of this role and how can it be successfully implemented?

PREMISES. Our major premise is that we are on the cusp of advances in a number of domains that will enable curricula and learning games to be offered in a way that engages the learner in content and encourages the learner to choose his or her own pathways to knowledge, tutors, peers, networks, and learning performance-oriented outcomes. One early stab at supporting this major premise is attached -- for your information or amusement.

Our first minor premise is that federal R&D programs -- if the RFPs and bidder conferences are properly structured -- can catalyze the requisite consortia both (a) to develop the advances and synergy in the diverse technology domains and, perhaps even more important, (b) to stimulate the diverse contents and learning games that will engage learners. Our second minor premise is that there will be a substantial and increasing market demand for such learning levers, once developed, from firms (including associations and consortia of firms), the federal government (e.g., DOD), homes (children, parents, incumbent workers, learners of all ages), and learning centers (libraries, community colleges, Universities, pre-schools, K-12 schools, a new set of interactive distance learning firms).

NEXT STEP. To enable us to test these premises against reality, we agreed at our meeting yesterday to attempt to outline RFP specs for the next round of TRP challenge grants. Henry Kelly agreed to take the lead in exploring the potential market demand, defining the terrain for potential R&D advances and bidder consortia, and canvassing a few prior reviewers and potential bidders and users. He will then provide a draft outline of RFP

specs for our review and discussion when we next meet -- on **February 24 at 8:30 a.m. in Room 230 OEOB**. Hopefully, this process will also help to inform how to proceed with the other relevant, federal R&D funding programs.

cc Bill Galston
Jack Donohue
Linda Roberts
Dorothy Robyn
Doug Ross
Mike Smith

IT'S LEARNING, STUPID!

We need to consider whether we are on the cusp of a technological revolution that will enable us to choose a new direction for lifelong learning for all Americans. Consider three, related shifts in paradigms:

1. It's Learning: Let the Learning Lever Begin. It is learning--not education, training, or schooling--that is at issue. From this perspective, the major hurdle has always been that we know that every person is different and unique. If we could invent efficient and effective means of learning, therefore, we would not be satisfied just by finding the common needs of most learners. Instead, we would try to customize the means of learning to serve each learner and to allow learners to proceed at their own pace, in their own styles, including by working at learning with one another in pairs or larger groups, as well as alone, at home, on the job or at school. Such a reinvented vision of learning might seem to depend on having all variety of tutors for virtually every learner. Yet the primary work is done by the learner, not by the tutor or teacher. As a result, we can begin to imagine a system where the learner connects up with tutors at various times, but can also do much of the work of learning on her own (or, together, with peers and parents). What would be most helpful to such a reinvented system of learning are a wide variety of levers to assist the learner (and peers, parents and tutors, firms and co-workers) along a wide variety paths to learning. We, therefore, call these new tools: Learning Levers.

2. It's technology: Let the Interactive Rebellion Begin. For such a learning revolution to proceed, of course, we will need a technological revolution as well. And, one is on the horizon if not already upon us. To date, most computers have been linear--yes-no, stringing words and bits together in a line, computing numbers, most triggered by a numerical/alphabetical keyboard. But icons, images, sounds, non-linear information and insights, rolling frames and stop action, interactive multi-media are all coming together. Miniaturization, compacting of data, new means of transmitting images, sound and information, and so much more are upon us. The potential for creating all variety of Learning Levers is a rebellion in the making.

3. It's Interactive Entertainment: Let The Games Begin. Finally, the smashing revolution may be that the real variety (and payoff) is not in the hardware or the systems software of Learning Levers: it's in the content, the programs, the entertainment, the production of the plays and the provision for the interactions with the players. Current estimates are that 1% of the revenues, profits, and jobs are in making the hardware, up to 4% in the systems software, and something like 95% in the content. Imagine if CD's, games, entertainment, interactive multi-media, and all manner of engaging content and multiple pathways to knowledge all came together with the revolution in technology and interactive communication!

Now, here is a potentially burgeoning new industry where the U.S. has a competitive edge on the rest of the world. If the 21st Century is to be an American Century as Ben Wattenburg argues, then Learning Levers could be a key to translating what he assumes is our current cultural dominance into a major economic advance for our firms and for our people. If the 21st century will belong to those firms and nations who learn how to increase productivity in ever expanding service sector as Drucker argues, then Learning Levers could provide the means to increase the skills of all Americans, the productivity of our workforce, and the competitiveness of our firms in the emerging global economy of information and knowledge.

**Crafting a Technology and Learning Challenge (TLC)
Decision Document for a Meeting of the
Education, Training, and Re-employment (ETR) Working Group**

August 11, 1994

The ETR working group has been preparing options for a national program aimed at using the power of modern information technology to achieve the Administration's lifelong learning goals -- including Goals 2000 and School-to-Work. This paper summarizes the work completed thus far. The primary purpose of the August 11 meeting will be to review a decision memorandum being prepared for the ETR principals on issues that must be resolved for FY96 budget decisions. A draft of the memo is attached.

THE VISION:

Computer and multi-media technology makes individualized, learner-centered, exploratory learning possible at affordable prices.

Communication systems can connect homes, schools, workplaces, and vast information resources by leveraging time at home (i.e. out of school and not at work)

These learning environments can lead to a major (2-sigma) improvement in learning productivity (see chart A)

CHALLENGE FOR THE ETR:

The technology of computers, communication systems, and multi-media systems is advancing at a rapid rate. The Administration's National Information infrastructure strategies aimed at ensuring universal physical connectivity are in progress. Investment in the development of high-quality interactive learning however, has been much less than investment in development of computer applications for businesses and entertainment. Education and training markets are fragmented and difficult to reach since the advantages of the new technology require major changes in learning strategies and pedagogic techniques and therefore extensive training for teachers and instructional staff.

OUR APPROACH:

Accelerating the development and adoption of technologies for learning requires integrated management of a wide variety of federal programs (see Chart B). The specific tasks undertaken by working groups are:

1. *Craft a coherent program for research, demonstration, and deployment of technology-based approaches to learning productivity. Three key components:*

- fundamental research
- technology-forcing demonstrations
- technology deployment and institution building

We believe that this last task requires more efficient management of existing research programs in many different agencies and, we believe, a major new program is needed: a community-based grant program for innovations in learning technology patterned roughly after the Administration's highly successful empowerment zone program.

2. *Ensure that the federal government exercises leadership in the use of productive learning technologies in federal programs*

- technology should be used wherever it is cost-effective in federal programs for education and training (such as Goals 2000, ESEA, Head Start, and Job Corps)
- effective federal procurements of learning technology can lower the cost and increase the quality of training of DoD and federal civilian employees, as well as stimulate private development of advanced instructional products

3. *Effective coordination with National Information Infrastructure programs designed to provide universal access to the new information superhighway.*

THE POLITICAL MESSAGE:

The Challenge Grant Program permits a high-visibility opportunity to focus attention on the administration's accomplishments in reshaping lifelong learning goals and introduces a powerful new tool for achieving these objectives.

In particular, the program is a powerful example of defense conversion and dual use technology -- much of what can be done is possible because of DoD's extensive investment in learning technology.

The program is based on federal partnerships with business as well as with state and local governments. There are obvious opportunities for creating major new business opportunities in an area where the US has a clear comparative advantage in world markets.

The program will provide a vivid and easily grasped example of the payoffs possible from the Information Superhighway.

Creative management of existing federal programs underscores the power of the "reinventing government" strategy.

PROGRESS TO DATE

1. The ETR established an interagency task force to explore opportunities for technology and learning.
2. OMB and NSTC, working in cooperation with ETR, issued guidance asking agencies to give high priority to technology and learning in their research budgets on May 6, 1994.
3. DoD hosted a workshop for Deputies on July 9th, and a consensus vision statement (attachment 1) was developed.
4. A series of interagency working groups are now charged with addressing specific issues. They were asked to review budget issues that must be considered promptly (to be discussed in the August 11 meeting), and to prepare a more extensive document outlining programmatic decisions by mid November, 1994.

Task Description	Team Leaders
Design an interagency plan for Research, Development and Demonstration on technology for learning productivity	Sharon Robinson and Lou Finch cochairs of R&D subcommittee, NSTC Committee on Education and Training.
Digitization Resources	David Lytel
Using the National Information Infrastructure for Education and Training	Tom Kalil Jonathan Sallet
Procurement for Defense and Federal Civilian Training	Mike Schmidt
Use of Learning Technology in Major Federal Programs	Rob Portman Mike Schmidt
Outreach	Jim Kohelenberger
Challenging competition for learning communities to develop and use interactive learning tools	Henry Kelly

Agencies involved include: DoD, DoC, DoL, DoED, HHS, DoT, NASA, DoE, Smithsonian, US Park Service, National Archives, Library of Congress, VA, National Endowment for the Humanities. Support provided by MITRE and IDA.

5. An August 5 memorandum from OMB (attachment 2) asks for a detailed budget analysis on a small number of high-priority administration R&D areas, including R&D on learning productivity, by September 29. It also suggests that "where useful and appropriate, Committees should review agency contributions prior to

September 9, 1994" in order to ensure that agencies request a balanced program in the area. The NSTC Committee on Education and Training (CET) is asked to conduct the review of R&D for learning productivity. The memo specifically notes the close coordination between the CET R&D analysis in learning technology and the ETR project.

FOCUS OF AUGUST 11, 1994 MEETING WILL BE ON CRAFTING A DECISION MEMORANDUM FOR ISSUES REQUIRING IMMEDIATE DECISION, SPECIFICALLY:

- size and structure of the new grant program
- management and funding for technology and learning R&D and Demonstrations
- funding for creating and disseminating digital resources

NEXT STEPS:

Based on decisions made by the ETR principals and the in-depth review by CET, agencies will include elements of a coordinated technology and learning program in their FY96 budgets by 9 September.

ETR task force will continue to define options concerning federal programs and procurements for decision by November 4.

Outreach efforts will solicit advice and guidance from businesses, NGOs, states and localities, teachers and, following the announcement of the program, help to ensure wide national participation in TLC programs and objectives.

PROGRESS REPORTS OF THE TASK FORCES WITH REPORTS DUE NOVEMBER 4.

1. Using Technology to increase the effectiveness of federal programs in education and training

Technology capable of significant advances in learning productivity can make it easier to achieve the goals of many federal programs. Wise management of procurements made under these programs can help stimulate markets for innovative learning technology. An interagency task force has been working to identify programs where technology can have a particularly significant impact and to identify specific changes in program management that can help secure these benefits.

Attachment 3 summarizes the work underway in each of the following programs:

Teams of people familiar with each of these programs are preparing brief analyses of following topics:

- How learning technologies can be used to improve the effectiveness of the program
- Specific recommendations for using existing FY95 funding and authority
- New legislative authority, if any, needed to ensure effective use of technology

The project teams will work together on common themes and areas where interagency coordination appears to be particularly useful, including:

- How the programs can use the technological expertise available in other federal programs
- Improving methods for federal purchasing of computer hardware and software for education and training
- Coordinating purchases of hardware and software by program recipients to help these recipients get the highest quality products at low cost and to help stimulate markets for high-quality instructional materials.
- Using the outreach centers available to different programs (Chapter 1, Head Start, others) to improve communication among program recipients about instructional technology and improving coordination between these programs
- Defining methods for measuring and specifying quality standards for educational and training technology and gaining consensus on technical standards and interoperability
- Improving and coordinating technical assistance and training

2. Procurement for Military and Civilian Training

Efficient operation of the federal government depends on maintaining the skills of its workers. The Nation's security has always depended on the quality of the training programs available for the uniformed and civilian personnel in the Department of Defense -- including maintenance of skills in the reserves. The challenge has become greater as new technologies constantly redefine the skill requirements of federal civilian and military employees. Defense Training programs, the Office of Personnel Management, and other federal agencies responsible for federal training are coordinating their work to (a) ensure that federal training makes efficient use of cost-effective training technology

available on the market and, (b) procures training products and services in ways that stimulate innovations in instructional technology. All federal procurement will be designed to stimulate innovative private firms capable of selling innovative, technology-based training systems to civilian as well as to government training organizations. Federal training programs will get more for the public money they spend, and federal employees will receive better training in less time, if innovative private businesses compete to provide efficient, low-cost training systems.

3. National Information Infrastructure

Improving the quality of education and training has been one of the key goals of the administration's National Information Infrastructure Task Force. The principles guiding the NII are as follows: encouraging private investment in the NII, promoting and protecting competition, providing open access to the NII by consumers and service providers, preserving and advancing universal service to avoid creating a society of information "haves" and "have nots", and ensuring flexibility so that the newly adopted regulatory framework can keep pace with the rapid technological and market changes that pervade the communications and information industries. The ETR task force has identified a variety of options for applying these principles to the needs of education providers. Options include use of existing FCC authority and new state authority resources potentially available from pending legislation for ensuring universal access, model practices, the purchasing power of provider operating budgets and home learner demand, and direct funding from federal and state agencies. The analysis also includes options that may make education markets more profitable for communication companies and software providers.

4. Outreach

This task force is designing a program to contact key stakeholders and potential collaborators in education, training, and state/local governments to identify programmatic needs. Business interests include communication, entertainment, software publishing as well as business organizations with broad interests in improving the quality of US education.

The group is planning a series of focused workshops and seminars this fall aimed at identifying the barriers to expansion of learning technology in different markets.

Finally, this group will prepare a communication and events strategy to make the Technology and Learning Challenge a major component of the President's life-long learning strategy to empower all American schools and students, firms and workers to compete and win in the global economy of the 21st century.

Draft Decision Memorandum

The three decisions outlined below will be presented to the principals of the ETR in the next few weeks.

Decision 1: Structure of A New Challenge Grant Program

Mission:

To stimulate community based design and implementation of creative new uses of technology to advance life-long learning (specifically goals-2000 and school to work objectives)

Why Is It Needed:

- major under-investment in content
- markets for learning technology are fragmented and hard to reach -- particularly in schools and small businesses
- requirements for developers are poorly defined
- products are limited in scope and successful concepts seldom move to large markets

A Proposal:

A challenge for learning communities to bring together the critical elements of a successful technology application in a way that helps schools, businesses, and the community as a whole. The grant program would be modeled roughly after the empowerment zone program. As in the case of the empowerment zone proposals, the most important achievement of the challenge is likely to be the creation of community teams that can work together to improve interactive learning with relatively limited federal assistance. The grants would cover content (e.g. software that allows learners to experiment and play with ideas in simulated environments only). Hardware and network capacity or connections would be provided by the proposal team.

Which Communities Would Be Encouraged To Apply:

1. Communities linked by geography
2. Virtual communities linked by a common interest such as:
 - disabled groups
 - groups interested in teaching math, science, history, or some other specialty
 - small businesses with a common training problem

Who Could Propose:

Proposals would be solicited from complete learning communities that would need to include the following types of participants: school systems, colleges and universities, local businesses, content experts, learning and cognitive development experts, software designers (broadly defined to include video, music and computer software), and telecommunication firms.

How Would The Proposals Be Judged:

- does it offer a creative new vision for using technology to advance lifelong learning goals: Goals 2000, school-to-work, higher education, incumbent worker training?
- if successful, are the results of the strategic vision exportable to other communities?
- is there a comprehensive community plan for education and training that will continue to be supported by the community as an integral part of its instructional programs?
- what is the extent of investment by the partners in the plan?
- What evidence is there that the proposed program will succeed, what benchmarks will be established, and how will progress toward the goals be evaluated?

How Much Would It Cost:

The central question is, "How large a grant would be needed to get a learning community to make the effort to craft a proposal and plan and implement the plan?"

A representative estimate is that an adequate program would include:

10-15 grants for \$4-6 million/year for 4 years

100 grants for \$500 thousand/year for 4 years

total: \$100 million/year

Existing Funding Available:

ESEA is likely to receive \$20-50 million appropriation in FY95 which can be used to begin this challenge grant competition. The program is likely to be limited to education for grades K-12 (including school to work but not adult training).

Management/Funding Options

However the program is funded, it would operate under the umbrella of an interagency coordination team (including DoED, DoL, DoD, DoC, DoE, NSF, NEH, NASA, OSTP, OVP, DPC-NEC, OMB). Funding options are as follows:

Option (1) Direct all funding to ARPA in DoD

Pro:

- comparative ease of adding funding in a respected and experienced R&D agency
- strong program management abilities
- proven track record in technology for learning

Con:

- pre K-12 education not central to DoD mission
- not consistent with shift to civilian R&D
- links to ESEA program, Goals 2000 and school to work would be unclear

Option (2) Direct all funding to DoED

Pro:

- mission covers most relevant learning communities
- DoED needs a focused R&D program supporting its mission
- builds on ESEA funding available in FY95

Con:

- administration difficulties in getting education programs through relevant appropriations committees
- little experience with managing R&D challenge process

Option (3) Combined program with programs for children and youth (pre-school through school to work and college) funded through DoED and programs for adults funded through DoD/ARPA.

Pro:

- most likely to achieve total funding needed
- follows successful model of Empowerment Zones using HUD and USDA funding

Con:

- more complex management
- funding would require dealing with more Congressional committees
- could discourage proposals combining programs for children and adults

What Could The Federal Government Offer Winners Other Than Direct Challenge Grant Funding

- digital resources needed by the project would receive high priority in federal decisions about which federal data should be digitized first (e.g. in the Smithsonian or National Archives)
 - access to technical assistance from federal laboratories, NASA, or other facilities (possibly prearranged as a part of the application process)
 - access to funding for connectivity by combining a TLC-grant application with application for DoC/NTIA
 - Access to NEH program funding by combining the application with an NEH application
 - access to state funding for hardware by combining federal and state decision reviews
-

DECISION 2: IMPROVED MANAGEMENT OF FEDERAL RESEARCH, DEVELOPMENT, AND DEMONSTRATION PROGRAMS AIMED AT TECHNOLOGY FOR LEARNING

Observation: Research, Development, and Demonstrations aimed at improving learning technology is as important a focus of public research funding as R&D for health, energy, the environment, and other key public goals which have traditionally received major federal R&D support. Fragmented and uncertain markets and high risk have discouraged private R&D -- the primary exceptions being entertainment markets and projects focused on sophisticated military or industrial training requirements. We do not currently have a well balanced federal R&D program on technology and learning, and fragmented management runs a high risk of poor use of existing assets.

Recommendations (approve/disapprove):

- (1) Effective coordination of federal R&D on technology and learning is essential. *The Subcommittee on Education and Training Technology of the NSTC/CET should provide the management resources needed to craft a detailed plan for federal activities in this area, estimate the priority and funding recommended for each major R&D area, and recommend how each participating agency can best contribute to the research needed. (A list of critical R&D areas prepared by the CET is listed in attachment 4.)*
- (2) Demonstrations of learning technology that stress the state-of-the art are critical for identifying research needs and testing concepts in realistic learning environments. *Agencies with education and training missions should work with the technology agencies in the CET group to define a small number of ambitious demonstration projects that could become the focus of major interagency efforts. The group should propose ways of funding demonstrations in FY95 as well as suggesting appropriate funding levels for inclusion in FY96 requests. Attachment 5 shows a representative list of demonstrations.*

DECISION 3: FUNDING FOR DIGITIZATION

Observation: Digital representations of text, sound recordings, data, photographs, motion pictures, and other information are key raw materials for learning technologies. Once digitized these materials can be stored, copied, and communicated throughout the nation and the world at very low cost. The federal government controls access to unique collections of information whose availability in digital form could greatly accelerate development of content and use of learning technology.

Recommendations (approve/disprove):

- (1) The authorization for the Library Services and Construction Act LSCA Title II should be changed to encourage use of the funds (FY94 authorization \$18 million) for development and dissemination of digital resources. The "construction" funding provided by Title II is now spread so broadly by formula allocations that US libraries are not well served by the program. If redirected to take advantage of emerging information technology, the LSCA would provide libraries with powerful and practical new information resources.
- (2) While adequate funding appears to be available in NASA, NOAA, USGS and other agencies for making technical information available in digital form, resources for digitizing cultural resources are inadequate. \$4 million should be made available to a consortium of Smithsonian Institution, the National Archives, and the Library of Congress for a major coordinated program to digitize historical archives we suggest picking a specific theme for the FY96 funding, such as social history of the US). Such a project can not be accommodated within the \$1M now planned for the Smithsonian's FY96 budget request; and additional \$1M for access to electronic records is needed by the National Archives and will be in their FY96 budget request.
- (3) Support the NEH request for an increase in appropriations for digital resources from \$11M in FY95 to \$21M in FY96.
- (4) *The interagency team now working with the ETR should deliver a comprehensive plan for developing and disseminating federal digital resources by November 4, 1994 including programs for: (1) R&D on efficient tools for capturing and disseminating digital information, (2) building collections, (3) dissemination, and (4) providing assistance for groups around the country with specific digitization plans (arts, science, local culture).

Chart A 2 Sigma Learning Shift

Chart B Federal Programs

Attachment 1 Vision Statement

Attachment 2 Rivlin Memo

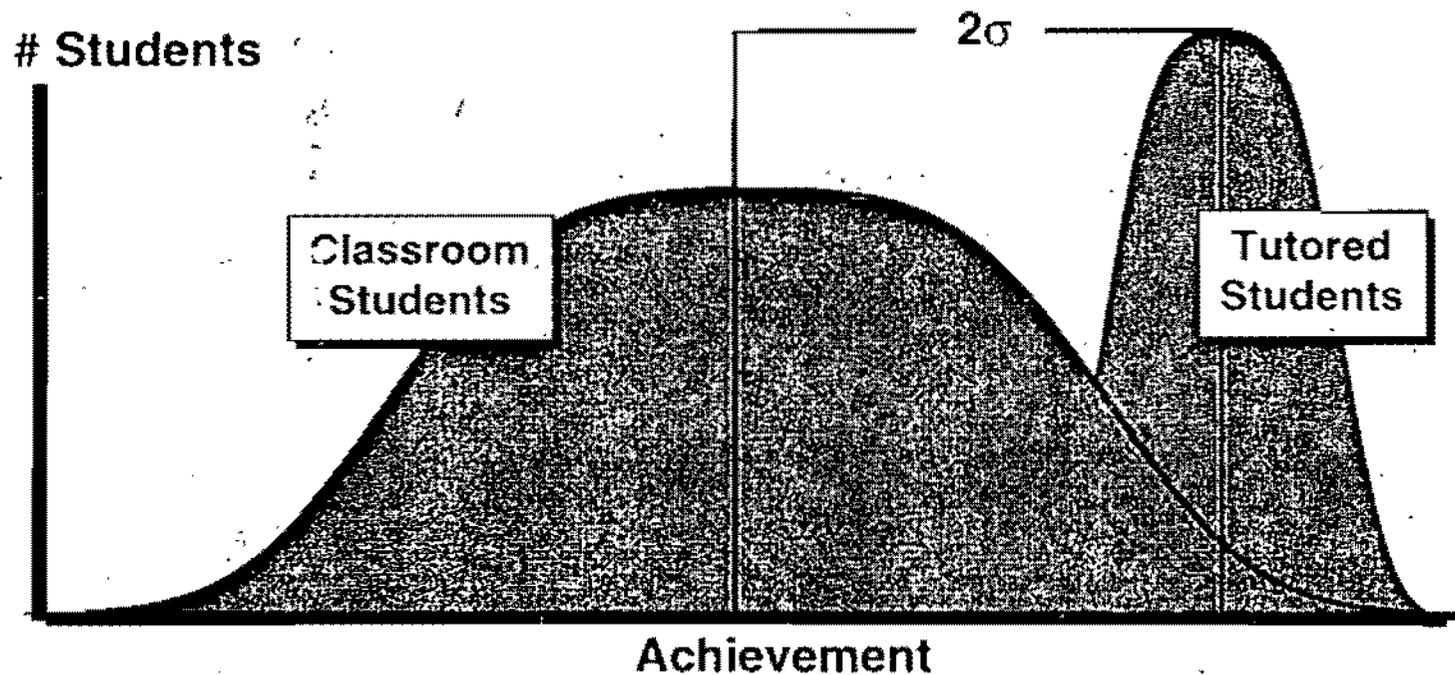
Attachment 3 Federal Programs

Attachment 4 R&D Focus Areas

Attachment 5 Demonstrations

CHART A

The Learning Revolution's Core: Tutor Learning Through Technology



**ON AVERAGE, TUTORED STUDENTS SCORE BETTER THAN 98%
OF CLASSROOM STUDENTS -- A 2-SIGMA SHIFT**

CHART B

CHART B

Moniker	Authority
Goals 2000	Goals 2000 Educate America Act
School to Work	School to Work Opportunities Act
Eisenhower	Dwight D. Eisenhower Mathematics and Science Education Act
Vocational Education	Carl D. Perkins Vocational and Applied Technology Education Act
Head Start	Head Start program in the Human Services Amendments of 1994
Technical Assistance Centers	Elementary and Secondary Education Act (ESEA)
Regional Education Laboratories	Goals 2000 Education Act Title 10
Special Education	Individuals with Disabilities Education Act
Compensatory Education	Chapter I of the Elementary and Secondary Education Act of 1965 (1994 amendments pending)
Individuals with Disabilities	<p>Technology, Educational media, and materials program for individuals with disabilities, Part G of the Education of the Handicapped Act 1986</p> <p>Technology-Related Assistance for Individuals with Disabilities Act of 1988 as Amended in 1994</p> <p>Captioned Films, Television, Descriptive Video and Educational Media in Part F of the Individuals with Disabilities Act</p> <p>National Institute on Disability and Rehabilitation Research in the Small Business Innovation Development Act of 1982</p>
NIST Manufacturing Extension Program	Omnibus Trade and Competitiveness Act of 1988 (1994 amendments pending)

Attachment 1 Vision Statement

Vision: Improving the Productivity of Learning through Interactive Learning Technologies

While virtually all other sectors of our economy have been transformed by technological innovation and accompanying structural reorganization in the twentieth century, education and training in schools looks much like it has for generations. Computers and advanced communication technologies are revolutionizing banking, finance, entertainment, and many other information-rich businesses and helping them tailor services to individual customers. But these technologies have had little impact on learning productivity. The most advanced communication system in most classrooms is not even the telephone but the classroom bell and the public address system -- technologies that have only reinforced the traditional "egg-crate" configuration of isolated classrooms. All of this is about to change. Three elements are now converging with the potential to create a revolution in the productivity of learning.

First, a new consensus is emerging about the dynamics of learning: The primary work of learning is done by the learner not the instructor. All students are different, they learn at their own pace, often in different styles. The work of learning is more engaging for the student if it involves active interaction and occurs in a meaningful context, rather than through passive listening or watching in the abstract. In this new perspective, the role of the teacher is no longer that of a talking head standing in front of a class of 25 students: the teacher becomes a coach of teams of learners, and students of all ages (including peers, parents, and easily accessible experts and tutors) are the active participants in a community of learning. Students taught by individual tutors do better than 98% of students taught in standard "mass production" class room settings (see figure 1). Emerging technology makes it possible to provide learner-centered contexts for learning tailored to individuals without a prohibitive investment in new materials or increases in instructional staff. America's teachers -- and their union leaders -- are demanding that schools not be left out of this revolution.

Second, technological advances in computers, multi-media, data-storage, and communication are creating dramatic new ways to communicate complex ideas and experiences. The potential for creating a new generation of interactive learning tools is upon us. The technology can create interactive learning environments that invite exploration and approximate the experience of working with individual tutors. We can realize this potential, however, only if we can bring the creators of the new technologies together with the makers of essential learning content to transform games, information, and entertainment into engaging curricula for all ages, interests, needs and styles of learners.

Third, diverse means of transmission and telecommunication are being developed that will enable learners of all ages to connect with these learning tools -- and with other learners, experts, and tutors -- in schools, workplaces, and homes. Virtual learning communities can thereby be created between coaches, tutors, peers, parents and children, and learners of all ages to use these new learning tools at all hours of the night or day, on weekends, throughout the year. The extent of learning and the effectiveness of teaching no longer need be a prisoner of the amount of seat time in a classroom.

The Department of Defense and many innovative education and training programs around

the nation have demonstrated that these three elements can combine to achieve a sharp increase in the productivity of learning. DoD has achieved such success with new learning tools that it is rapidly expanding its investment in these innovative technologies. The interactive technologies have been successfully used to promote learning in a diverse range of jobs (surgeons, nurses, electronic and mechanical repair technicians, operators of all kinds of equipment, and whole teams of combatants), as well as providing basic and advanced skills in areas like mathematics. In each of these areas, the participants achieve substantially higher results at lower costs than would be possible using traditional learning techniques. The DoD successes need to be moved rapidly to civilian learning. Defense training can also benefit from the growth of innovative civilian providers of learning technology since such businesses can provide improved training products at lower costs.

The full potential of technologies can only be captured if they incorporate engaging learning content and innovative learning strategies (Figure 2). To exploit the potential of such learning technologies, it is essential that we find a way to catalyze development of such effective learning tools for all learners. For example:

- Children's television programming like Sesame Street and Mr. Rogers Neighborhood has enriched the learning experiences of pre-children for the past 25 years even though the current generation of television watching is basically a passive experience. The new generation of interactive televisions, video-games, and other consumer equipment will permit -- indeed require -- active participation on the part of children. The challenge is to combine the experts on early childhood development, producers of engaging games and adventures for children, and technology experts to develop a new generation of children's programming that will combine exploration, adventure, games, and learning. If this happens, the first national education goal -- all children arriving at school prepared to learn -- will be much easier to reach.
- New information systems make it possible to create learning environments that simulate experiences ranging from walking through adventures set in synthetic representations of the historic discoveries in science, to exploring the biology of synthetic ponds to learning math through vivid confrontation with real-world problems. They permit instant access to state-of-the-art data and expertise around the globe. Math and science learning communities across the country are developing the curricula, frameworks, and assessment methods needed to reach the national education goal of preparing our high-school graduates to be first in the world in these critical subjects. Realizing this potential may well depend on catalyzing a unique collaboration between teachers, subject matter specialists, entertainment industries, software designers, and communities across the country.
- Only a quarter of high-school graduates complete four years of college. School systems around the nation are being challenged by the new School-to-Work program to design innovative programs (e.g. apprenticeships) to help all students learn in the context of work and to make a transition from learning in school to learning on the job, to higher

education, and to learning for next jobs. Emerging technology can make experiences simulating a variety of training on-the-job available in schools and student homes during the next few years. These systems will help students demonstrate that they have the practical skills and problem-solving ability needed by employers. Interactive programming capable of exploiting this potential can be developed by encouraging local businesses, schools, training institutions, and communication businesses to form teams with providers of relevant learning content.

- Businesses of all sizes recognize that adaptability and flexibility are central to corporate survival. This flexibility can only be achieved if their workers -- as individuals and as teams -- are able to keep pace with advanced equipment without expensive off-site training. The kinds of simulated environment now possible with new technologies allow operators of all types of equipment to learn new levels of competence or quickly re-learn seldom used skills. But developing the interactive learning systems to realize this potential will require combining subject-matter experts, experienced trainers, and software developers -- a task that is well beyond the means of a typical small business or community college. If interactive learning experiences can be made available on the job or at home, the goal of lifelong learning is within our grasp.

Our challenge is to determine whether and how we can catalyze the development and deployment of interactive learning tools that can dramatically improve the productivity of learning for all Americans. If we succeed in this endeavor, we will help to create an important lever for achieving the President's agenda for lifelong learning.

Figure 1
Learning Productivity

Attachment 2 Rivlin Memo



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

THE DIRECTOR

MEMORANDUM FOR THE HEADS OF DEPARTMENTS AND AGENCIES

FROM: Alice M. Rivlin *AMR*
Acting Director

SUBJECT: FY 1996 R&D Data Collection and Review

On May 6, 1994, the agencies were sent a memorandum from OMB (M-94-20) outlining the FY 1996 research and development (R&D) policy principles and priorities. Attached you will find a memo signed by the President's Science Advisor and I providing you with the additional FY 1996 R&D data collection and review information that was mentioned to be forthcoming in the May 6th memorandum. Also attached is a list of NSTC agency representatives. You should address any further questions you might have on this memorandum to your agency's NSTC representative.

Attachments

NATIONAL SCIENCE AND TECHNOLOGY COUNCIL
DEPUTIES GROUP ON FY. 1996 R&D PRIORITIES

William M. Wise	Office of the Vice President
Timothy Wirth	Department of State
John Deutch	Department of Defense
Deborah Knopman	Department of the Interior
Richard Rominger	Department of Agriculture
David Barram	Department of Commerce
D. James Baker	National Oceanic and Atmospheric Administration
Robert Portman	Department of Labor
D.A. Henderson	Department of Health and Human Services
Mortimer Downey	Department of Transportation
Charles Curtis	Department of Energy
Madeleine Kunin	Department of Education
Gary Foley	Environmental Protection Agency
John R. Dailey	National Aeronautics and Space Administration
Neal Lane	National Science Foundation
Alice M. Rivlin	Office of Management and Budget
W. Bowman Cutter	National Economic Council
Bruce Reed	Domestic Policy Council
Joseph E. Stiglitz	Council of Economic Advisers
James W. Reed	National Security Council
Harold Varmus	National Institutes of Health
John Holum	Arms Control and Disarmament Agency

Kolvenberg
Kinney

NOVEMBER 13, 1995

MEMORANDUM FOR EDUCATIONAL TECHNOLOGY WORKING GROUP

FROM: KINNEY ZALESNE (X67871)
OFFICE OF THE VICE PRESIDENT - DOMESTIC POLICY

SUBJECT: EDUCATIONAL TECHNOLOGY EXECUTIVE ORDER

Attached please find a draft of the Educational Technology Executive Order. After consultation with many of the Federal agencies that have interests in education, technology, and/or property disposal, OVP has drafted this Executive Order that will ensure that the Federal government meets its commitment to put high-quality computers in America's classrooms. In particular, the Executive Order would:

- Permit agencies to transfer equipment directly for use in all curricular subjects, not just math and science (the current Bush order limits donations to math and science).
- Allow intermediate transfer of equipment to non-profit reuse and recycling organizations, so that schools get higher-grade equipment. Under the Bush order, old equipment is transferred as is. This has quickly made schools the dumping grounds for bottom-of-the-line, surplus Federal equipment.
- Permit donation of computers to Head Start and other pre-kindergarten programs.
- Allow donation to educational organizations besides schools, such as teen tutoring centers or hospitals that treat school-age children for lengthy periods of time.
- Create a priority for giving computer equipment to schools in Enterprise Communities and Empowerment Zones.

• Most importantly, the Order would centralize all information about available Federal computers onto one comprehensive, on-line data base, accessible to all eligible recipients via the Internet or an 800 telephone number. The independent data base is crucial, because unlike other equipment transferred by the government, computers lose their value quickly. They cannot afford to sit around in warehouses while prospective donees undertake lengthy bureaucratic procedures.

Call on the Federal agencies to come up with a standard format that would make it possible to link all of the information together.

Currently, in the attached draft, this data base is run through the Interagency Learning Technology Office and modeled on a similar program that already transfers educationally useful Federal equipment to universities. One question for us to address is the appropriateness of ILTO to serve as the central agency for our purposes.

The agencies will be asked to work together to create a one single-point of entry.

The Executive Order would also address, although on a smaller scale, the other three pillars of the Administration's Educational Technology Initiative. Specifically, it would:

- Encourage Federal employees who have computer expertise to help train America's teachers, and to give them ongoing technical assistance.
- Encourage such employees to help connect America's classrooms, using Federal time and resources if available.
- And, although nothing in the Order expressly addresses the Content portion of the Initiative, the establishment of the first three pillars – computers in the classroom, teacher training, and connectivity – will make the private educational software market ripe for creating engaging, meaningful, children's software.

After comments from this Working Group, OVP will send this Order to the Office of Legal Counsel at DOJ to iron out its legal wrinkles. Then, it will go through the larger OMB circulation process. We look forward to hearing your comments.

EXECUTIVE ORDER

EDUCATIONAL TECHNOLOGY: ENSURING OPPORTUNITY FOR ALL CHILDREN IN THE NEXT CENTURY

In order to ensure that all American children have the skills they need to thrive in the information-intensive twenty-first century, the Federal Government has committed to work with the private sector to guide four major developments in American education: 1) making modern computers an integral part of every classroom; 2) providing teachers with the training and assistance they will need to use new technologies effectively; 3) connecting classrooms to the emerging National Information Infrastructure; and 4) encouraging the creation of educational software as engaging as the best video game and as inspiring as the finest tutor.

With this Executive Order, the Federal Government commits its own, limited resources to these four vital developments. First, the Order streamlines the donation of excess Federal computer equipment to all of our nation's classrooms, including pre-kindergarten, for instruction in every subject. This provision reflects the Federal Government's commitment to let no American child start school behind, and to provide that once in school, all students benefit from computers in every field of study. The Order further encourages the donation of excess Federal computer equipment to other community-based educational organizations besides schools, in recognition of the fact that so much learning takes place outside of class.

Second, the Order provides for the donation of Federal time, energy, and expertise to teacher training. Teachers are the key to unlocking technology's power to enhance students' opportunity in the twenty-first century. Teachers must receive all the training and assistance they need to make full use of new and emerging technologies.

Third, the Order encourages the use of Federal expertise and resources to help support the private sector's commitment to connect classrooms to the National Information Infrastructure. Once the hardware, teacher training, and connectivity are in place, the Federal Government believes that the market will be ripe for the crucial, fourth development: the creation of modern, excellent software that will help prepare America's children for the technology they will encounter in the workplaces of the twenty-first century.

Accordingly, by the authority vested in me as President by the Constitution and the laws of the United States of America, including the provisions of the Stevenson-Wydler Technology Innovation Act of 1980, as amended [15 U.S.C. 3701, *et seq.*], and the Federal Property and Administrative Services Act of 1949, ch. 288, 63 Stat. 377 (codified as amended in scattered sections of the United States Code), it is hereby ordered as follows:

Section 1. Efficient Transfer of Educationally Useful Federal Equipment, Upgraded When Necessary, to Schools and Other Community-Based Educational Organizations

(a) To the extent permitted by law, all executive departments and agencies (hereinafter referred to as "agencies") shall give highest preference to schools and other community-based educational organizations in the transfer or donation of educationally useful Federal equipment.

(b) Agencies shall give particular preference to schools and other community-based educational organizations located in Enterprise Communities and Empowerment Zones.

(c) Each agency shall, to the extent permitted by law, identify educationally useful Federal equipment that it no longer needs and transfer it to a school or community-based educational organization by:

(1) Conveying research equipment directly in accordance with the provisions of subsection 3710(i) of the Stevenson-Wydler Technology Innovation Act of 1980, as amended [15 U.S.C. 3710(i)]. The transfer of such equipment shall be reported to ~~the Interagency Learning & Central Body Technology Office (ILTO);~~ *designated agreed to by the agencies.*

(2) Reporting excess equipment to the GSA for donation when declared surplus in accordance with the provisions of section 203(j) of the Federal Property and Administrative Services Act of 1949, as amended [40 U.S.C. 484(j)]; or

(3) Conveying equipment, either directly or through GSA, to a non-profit reuse or recycling program that will promptly upgrade or refurbish it for transfer to a school or community-based educational organization pursuant to this Order.

(d) All transfers to schools or community-based educational organizations, whether made directly, through GSA, or through a non-profit reuse or recycling program, shall be made at the lowest cost permitted by law.

(e) The availability of educationally useful Federal equipment shall be made known to recipients under this Order by all practicable means, including the on-line data base [NAME], designed and monitored for this purpose by ILTO. ILTO shall further:

- within 90 days of this order the agencies shall develop a*
- plan for streamlining the down listing of equipment, set standards to assure this info. can be accessed across agency*
(1) issue guidance for use of this data base to agencies and recipients under this Order;
 - (2) oversee the collection of data concerning the availability and transfer of all educationally useful Federal equipment pursuant to this Order;
 - (3) provide a standardized gift agreement for use by the agencies; and

*DDP
DDE
MBA
NLSA
DDP*

and designate an office to coordinate these efforts

(4) serve as the sole authority on the kind and type of educationally useful Federal equipment made available regardless of standard Federal classification, or whether it be capitalized or non-capitalized, or reportable or non-reportable.

(f) The Department of Energy shall provide technical support to ILTO for the dissemination of information concerning available Federal educationally useful Federal equipment. It shall be reimbursed by ILTO for this service. In addition, the General Counsel of the Department of Energy shall serve as counsel for this executive effort, and the Program Manager of the Department of Energy's personal property programs for the academic community shall serve as director of implementation at ILTO.

(g) A third-party non-profit organization may serve as fiscal agent for efforts for ILTO to foster financial and in-kind participation from the private sector. Support may also be acquired through use of existing arrangements at agencies participating with ILTO.

Section 2. Training Teachers: Connecting Classrooms

(a) Each agency that has employees with expertise in computer operations shall, in accordance with the guidelines of the Office of Personnel Management, provide and encourage brief periods of excused absence for those employees to volunteer time and resources to:

- (1) help connect America's classrooms to the National Information Infrastructure;
- (2) help supplement teacher training, preferably in partnership with universities, State and local school authorities, corporations, and other community-based organizations; and
- (3) provide ongoing maintenance and technical assistance for the recipients of educationally useful Federal equipment pursuant to this Order.

(b) Each agency described in subsection (a) shall submit, within 6 months of the issuance of this order, an implementation plan to advance the developments described in this Order, particularly those required in this section. The plan shall be consistent with approved agency budget totals and shall be coordinated through ~~ILTO~~ OMB.

(c) Nothing in this Order shall be interpreted to bar a recipient of educationally useful Federal equipment from lending that equipment, whether on a permanent or temporary basis, to a teacher, administrator, student, employee, or other designated person in furtherance of educational goals.

Section 3. Definitions. For the purposes of this order:

(a) "Schools" means individual public or private education institutions encompassing pre-kindergarten through twelfth grade, as well as public school districts.

(b) "Community-based educational organizations" means non-profit, local or statewide entities that are engaged in collaborative projects with schools or that have as their primary focus the education of children of school age. Such organizations shall qualify as non-profit educational organizations for purposes of section 203(j) of the Federal Property and Administrative Services Act of 1949, as amended. Their activities shall further qualify as technical and scientific education and research activities for purposes of section 3710(i) of the Stevenson-Wydler Technology Innovation Act of 1980.

(c) "Educationally useful Federal equipment" means computers and related peripheral tools, including telecommunications and research equipment, that are appropriate for use in pre-kindergarten, elementary, or secondary school education.

(d) "Non-profit reuse or recycling program" means an organization able to upgrade computer equipment at no or low cost to the school or community-based educational organization that will eventually take title to it. Such organizations shall constitute non-profit educational organizations for purposes of section 203(j) of the Federal Property and Administrative Services Act of 1949, as amended. Their activities shall further qualify as technical and scientific education and research activities for purposes of section 3710(i) of the Stevenson-Wydler Technology Innovation Act of 1980.

Imp. Historical
Document.

EXECUTIVE OFFICE OF THE PRESIDENT

07-Dec-1995 02:53pm

TO: Kenneth S. Apfel
TO: Robert E. Litan
TO: Michael T. Schmidt
TO: Henry C. Kelly
TO: Barry White

FROM: Paul R. Dimond
National Economic Council

SUBJECT: Ed Tech Funding

Team,

This draft incorporates the substance of your good suggestions (as well as those of Greg Simon, Johnathan Sallet, and Mike Smith). As you will see, the form of the recommendation is for Laura and OVP to convene the principals to discuss.

Let me know if you have any heartburn on this. Otherwise, we await a convening of the principals at an appropriate time.

In the meantime, we'll keep plugging away on trying to pull in mor fruit from the outreach effort, get the draft national plan squared awy with WH Communications and OVP, and prepare for whatever may eventuate in the new year.

Thanks for your help.

~~Dimond~~
Dimond

DRAFT

December 6, 1995

MEMORANDUM FOR LAURA TYSON- NEC
GENE SPERLING - NEC
GREG SIMON - OVP

FROM: PAUL DIMOND - NEC
TOM KALIL - NEC
BILL CURRY - WH Communications
KEN APFEL - OMB
BOB LITAN - OMB
HENRY KELLY - OSTP
MIKE SCHMIDT - DPC
MIKE SMITH - DoEd
JOHNATHAN SALLET - DoC

SUBJECT: FEDERAL MATCHING GRANTS TO THE STATES FOR
EDUCATION TECHNOLOGY

We recommend that you convene the relevant Principals at an appropriate time to discuss whether the President and Vice-President should consider, as one of the options for new investments for the FY97 Budget, a federal matching fund to support State and local efforts to increase the use of technology in teaching and learning. As summarized below, we believe that such a federal matching fund would help realize the goal set by the President and the Vice President -- technological literacy for all children at the dawn of the 21st century. There is a legislative authority in place that could provide the basis for such a federal matching fund. At an appropriate time, the Principals will therefore need to determine (1) whether such a fund is a viable policy and political option and (b), if the answer is yes, the amount that should be on the table to compete with other priorities as final FY97 Budget decisions are made.

Background. For your information Tab A attached summarizes:

- the education technology vision and four component goals (connections, computers, teacher training and content) established by the President and Vice-President
- their important announcements, events and meetings to date
- the schedule of meetings with a wide range of stakeholders that will lead to their joining in a major announcement and event with the President and Vice-President in mid-January in advance of the State of the Union Address.
- the other federal and non-federal policy proposals and initiatives on which we are now working

Factors in Considering Federal Matching Fund

1. The Extent of Costs. As in every such national challenge, money is an issue -- even if we do everything that we can to craft this initiative as a grass-roots and largely state-local, private-sector revolution. Given the rapid advances in technology and the potential benefits of increasing competition in a rapidly growing market, however, estimating the total costs for connections, computers, teacher training and interactive content is difficult; and many of the costs are falling (e.g., in connections, on-going telecommunication services, multi-media computing and networking). In addition, schools have been increasing their investment in all four of the key components at an annual rate of over 15% per year for the past several years. K-12 schools now spend 1.3% of their approximately \$300 billion annual budget on these four components; if these trends continue, schools are projected to increase these investments to over 3.5% of their annual budget by the year 2005. The federal government, primarily through Title I, has financed approximately 20-25% of the state-local expenditures on education technology to date; and local districts are likely to continue to use a substantial share of these federal funds to defray some portion of the costs of education technology for the foreseeable future.

2. The Role and Test for any Additional Federal Funding. If these trends continue, most schools in the country will likely achieve the four components sometime between 2005 and 2010. Any additional federal funding should be considered only to extent necessary to catalyze -- in combination with all of the other policy and action proposals and the leadership of the President and Vice-President -- a more rapid transition to realizing this vision by the school year 2000-2001 in all schools. Our recommendation, therefore, focusses on these incremental transition costs and is strictly limited by the extent additional federal funding can be structured to serve as a lever to promote this faster ramp-up. As a result, we do not include the on-going operating costs for any particular component. We have also excluded incremental costs for aspects of components that should be met, at least in the first instance, primarily by private investment. Any new federal funding should be focused where they can be expected to make the most difference.

3. The incremental Transition Costs for the Four Components. This analysis proceeds component by component in order to reach a total sum of the order of magnitude of costs. As noted in section 4 below, however, the existing authorizing statute is much more flexible and permits states and localities to use the federal matching funds on any of the four components as they deem appropriate.

- Computers -- \$8.5 billion for acquiring in grades 4-12 one modern, network-ready computer per 4 students in each classroom at an average cost of \$1,250 per unit and two rapid color printers for every classroom at a cost of \$500 per printer. (This assumes that older computers, with appropriate upgrading, will be passed down to students in grades K-12 or that much less costly interactive learning devices will be developed for use in the early grades. It is also possible that schools may choose in grades 4-12 a different configuration as hardware, connectivity, and networking alternatives develop -- e.g., a "dumber" networked, even portable "terminal" for each student. The total incremental costs for acquiring and installing such alternative

configurations is likely to be of the same order of magnitude.)

- Teacher Training -- \$1.5 billion for the initial basic training of all teachers in the use of computers and educational technology. This estimate is based on a one-time cost of \$600 per teacher for the 90% of teachers who are not already technologically literate and fully capable of integrating education technology in the daily learning of their students; this estimate also assumes that the computer and software sellers will also provide an additional \$400 in technical training per teacher as a part of the price of acquiring hardware and software. (This does not include the on-going costs of professional development that school districts already bear. We assume that an increasing proportion of these costs will go toward integrating the use of new education technologies in the regular curriculum and daily learning of teachers and students. We also believe that new teacher technology networks -- both formal and informal -- will provide additional means for all teachers to develop new skills and strategies for integrating education technologies in the daily learning of students and teachers. Our estimate also excludes any on-going costs for technicians, technical coordinators and other support services that may be included in the regular operating budgets of schools as education technology becomes an integral part of each classroom. In other words, we would focus on building a foundation of technical competence, but leave to local districts the job of helping teachers integrate fully and creatively the content of education technology into the curriculum and the daily learning of students.)
- Education Software -- \$2.5 billion for initial acquisition and use. (This is a one-time "kick-start" to assure rapidly growing teacher and student demand for educational software. The education software market may include the purchase of interactive programs on CD ROMS, as well as the initial cost of access to interactive programs and discovery resources provide via networks and servers.)
- Connections -- \$0. In the first instance, we exclude the initial incremental cost for connecting all schools and classrooms to interactive networks. (We also exclude the on-going operating costs for use of such connections to interactive networks because these costs will have to be born in the normal school operating budgets as education technologies become an integral part of teaching and learning.) We exclude the initial incremental connection costs for five reasons:

First, the President and Vice-President have already called on the private sector to bear this cost.

Second, we have already succeeded in demonstrating the viability of this private sector approach to connections through announcing Net-Day in California, as have several other states (North Carolina, Iowa, Vermont, Delaware and West Virginia.) Major private sector companies are prepared to make additional announcements along these same lines. We also plan to orchestrate the announcement of Net-Days in several additional states over the coming months. Third, the rapid acquisition of Internet-capable computers by schools coupled with ample "kick-start" funding for educational software will provide a sustained and growing demand by schools, teachers and students (and through

them to a large proportion of homes) for the on-going services of the many potential competitors with long-term economic incentive to finance the initial connections.

Fourth, the cost of initial connections is rapidly falling -- for example, fiber optics now cost a fraction of previous cost as demand has grown, and wireless connections provide an economical alternative to connect rural schools (or old schools where some forms of wiring may be made prohibitively expensive due to the age or asbestos problems of some school buildings).

Finally, the President and Vice President have led support for the Snowe-Rockefeller and Universal Service Trust Fund provisions in the Telecommunication Bill in order to provide authority for federal and state regulators to encourage telecommunication companies to connect on an interoperable basis all schools and classrooms.

At this stage, therefore, it is important to keep the pressure on the private sector and the regulators to find the means to finance the costs of initial connections to schools and classrooms. Make no mistake, however, the costs of the initial connections are substantial -- an estimated \$10 billion. In announcing the federal education technology matching grants to the States, we therefore believe that it is prudent to provide for a review at the end of the second year to determine whether our assumptions on this count are being born out or whether alternative regulatory or funding decisions are appropriate.

4. The Structure of the Federal Education Technology Matching Grants. We propose considering an appropriation of \$500 million per year for five years to fund the current authorization for "School Technology Resource Grants" in Title III of the 1994 Reauthorization of ESEA. This is the Title under which we negotiated the very successful Technology Learning Challenge Grants -- which have already spurred consortia of local districts to join with major private sector, university and museum partners to develop and to integrate innovative, interactive education programming and learning into the daily learning of their students. Sections 3131-3135 and 3137 provide the authorization for federal funding for each state to run its own "challenge" to catalyze the rapid ramp-up of education technology so that it is integrated in the curriculum, teaching and learning by teachers and students in all classrooms, and parents are encouraged to become involved in the interactive learning of their children.

- State Qualification and Match. To receive funds, a State must submit an application to the Secretary of Education that (1) includes a "systemic statewide plan that outlines long-term strategies for financing technology education in the State," (2) explains how the private sector, museums and libraries and higher education will be involved in the planning and implementation, and (3) "meets such other criteria as the Secretary may establish in order" to enable the State to provide assistance to local districts with a high number or percentage of "children in poverty and demonstrate the greatest need for technology." The Secretary, therefore, can make this Education Technology Grant Program a variable matching fund by, for example, requiring the States to match the federal funding \$3-to-\$1 for "needy" districts and \$6-to-\$1 for other districts. [Other

federal funds could be used to meet this match. This will provide additional assurance that Title I schools are not left out of the education technology revolution. Most states are already preparing education technology plans as a part of their Goals 2000 initiative, which may but are not required to be used by a State as a part of this application.]

- Local Applications and Formation of Consortia. In qualifying states, local districts are then required to submit an application explaining how they will, in essence, integrate all four components of the President's vision into the daily learning of their students in order to meet challenging content and performance standards. Local districts are encouraged, as in the Technology Learning Challenge, to form consortia with one another and with libraries, museums, higher education, and the private sector to integrate education technology in schools and classrooms so that all students learn to higher skill levels.
- Uses of Funds. Funds received by a local district from the state can then be used to implement all four components of the President's vision. This includes the cost of initial connections and linkages to networks. We do not believe that the Secretary of Education has the authority under this legislation to prohibit the use of funds for this purpose. Nevertheless, we can make the case that the size of our federal funding excludes these initial connection costs, explain the reasons why, and encourage the States to exclude, in the first instance, the costs of such initial connection in their own strategies for using this matching fund to finance education technology. In fact, we could encourage the States -- through working with their own PUCs, the telecommunication companies and other connection competitors, and their own versions of NET-DAY -- to assure a rapid ramp-up in initial connections at the lowest possible up-front cost to the State and to local school districts.
- Evaluation. The Secretary of Education is authorized to develop procedures for state and local evaluations. The Secretary is also required to submit to Congress a summary of the State evaluations in 1998. This is the time when an evaluation of the assumptions going in, the actual experience and results, and any new potentials of the rapidly changing technologies will enable the President and Vice President to make appropriate proposals for modifying the funding and implementation of this matching grant program. This will permit any necessary mid-course corrections to assure that their extraordinary vision will be realized in all schools and classrooms by the 2000-2001 school year.

Conclusion: We believe that the other policy and action initiatives summarized in Tab A attached will contribute much to realizing the education technology goals of the President and the Vice President by the turn of the century. Many may even be more innovative and exciting than this federal matching fund proposal. Moreover, we will be working hard to ensure the maximum level of private, voluntary, and state-local governmental action. We believe that proposing this education technology matching fund is, however, critical to the success of the overall initiative for five reasons:

- it is necessary to achieving the stated goal of ensuring that all children are technologically literate by the dawn of the 21st century.
- it assures credibility for all of the leadership -- and the other policy and action initiatives -- provided by the President and Vice President.
- it demonstrates that the President and Vice-President are serious, smart, and prudent in proposing additional funds and a matching structure that is designed for the sole purpose of catalyzing the more rapid achievement of goals to meet the clear national interest.
- it demonstrates that the President and Vice President can continue to provide the leadership in making key national investments to achieve national goals while balancing the budget.
- by relying on an existing authorization that was designed to implement a key priority of the President and Vice President and was approved by broad bi-partisan majorities in both Houses, it requires the current Republican Congress to choose among three options -- (1) to join the common ground already established by the President and Vice President and the previous Congress in funding the authorized matching fund, (2) to propose and negotiate a better alternative to achieve the same goals, or (3) to demonstrate partisan extremism by objecting to an initiative that is widely supported by the American people and the major private sector players who care about this issue.

Jala
President's Initiative

MEMORANDUM FOR Laura Tyson
Don Baer
Gene Sperling
Bruce Reed

FROM: Jonathan Sallet
Paul Dimond
Henry Kelly
Linda Roberts
Greg Simon
Mike Schmidt

SUBJECT: Pursuing the President's Educational Technology Initiative in 1996

DATE: January 18, 1996

The first half of 1996 offers an opportunity for the President to present a compelling vision to the nation of students across America using technology as a tool to expand their education and their lives' opportunities. That vision can be summed up in the challenge already announced by the President -- to ensure that all of K-12 students are technologically literate by the dawn of the 21st century. The goal of technological literacy means more than simply teaching children how to operate a computer; it is the capstone of the four pillars that the President has announced: (computers, connections, teacher development & educational software) and, with those pillars, it serves as the fulcrum with which our children can move the world.

We suggest that the President, Vice President and several Administration officials announce the creation of a **National Report Card on Educational Technology** that would be issued at the end of each school year for the next five years by stakeholders representing all of the involved communities, including state/local governments, educators, teachers, businesses, students and parents at a national summit to be convened by the federal government. The National Report Card would tell the nation how well we are advancing on the critical goals outlined by the President:

- The number of modern, multimedia computers available to each student in each classroom;
- The percentage of classrooms connected to each other and the outside world;
- The percentage of teachers who are ready to use technology in their teaching; and

- The extent to which educational software and similar materials are available to students for use in their classrooms.

The meeting at which the Report Card is issued would also provide an opportunity for stakeholders to announce further actions to achieve each one of these goals.

At the end of January (hopefully in the State of the Union and at the stand-alone event discussed below), the President would announce that, at the end of this school year, he would convene the first such conference to issue the first such assessment and forge a consensus on what must be done. In order to demonstrate the kind of actions that are necessary to ensure that the national grade keeps going up and up, the President would, at the same time, announce actions, directed at each of the four goals, that can now be taken by the federal government, businesses and educators. Indeed, at the initial roll-out the President could stand next to a large blank, or interim, report card in order to help demonstrate what needs to be done.

This memorandum will discuss the background of the President's educational technology initiative and suggest how the National Report Card can be launched.

I. Background

Almost two years ago, the Vice President challenged America's business to connect every classroom (along with libraries, hospitals and clinics) to the Information Superhighway by the year 2000. He emphasized the importance of ensuring that our students are not left out of the Information Society and of guaranteeing that our society is not divided between information "haves" and information "have nots". A few weeks later, the President repeated this challenge in his State of the Union Address. In the first part of 1995, the Vice President built on that vision when he launched the Department of Education's Technology Learning Challenge Grants.

This fall, the President -- in San Francisco and Washington -- voiced his desire to ensure that all American children are technologically literate by the dawn of the 21st Century. He pledged that the Administration would soon unveil a national vision detailing how the nation would fulfill this goal through the accomplishment of four principles:

- making computers available to every K-12 student,
- connecting those computers to each other and the outside world,
- ensuring that teachers are able to develop their technological skills so that they are able to use technology effectively in the classroom, and
- stimulating the supply of educational software and associated materials that will form a critical part of each student's learning experience.

The core of the President's vision is, of course, the enormous gains in educational achievement that can be achieved using the new technology -- gains which depend on achieving the four specific goals. Students must be prepared for work which requires high levels of skills in traditional subjects and in modern technology. Adequate investment in educational technology can create learning environments which can adapt themselves to the need and interest of individuals, combine formal learning with learning through exploration and solving practical problems, give teachers rich tools to develop challenging assignments, tie classrooms and students' homes to a worldwide web of information resources and assistance, and the schools closer to parents, local businesses, and other parts of the community.

We will promote people, not just technology. That is why we must energize a national effort that, through combined private and public contributions, will demonstrate concretely to Americans why their children will be advantaged when the President's vision is realized and will demonstrate that a critical mass of resources is available to get the job underway. That work should feature American's biggest corporate names, teachers, parents and, of course, students themselves.

The President and the Vice President have already laid the foundation for that effort by meeting with top CEO's, including Michael Eisner, Gerald Levin and George Lucas, in September and October. Since then Administration officials have met with parents' groups, educators and businesses; talked with teachers; and, at the beginning of December, convened day-long sessions with stakeholders. From this intensive outreach effort, several conclusions have appeared:

First, leadership by the President and the Vice President is absolutely essential. Unlike great national missions of the past, the pursuit of the President's vision will not be run and financed by the federal government. Rather, citizens at every level of government must come to believe that the goal is important and their contributions, vital. Only the bully pulpit of the Presidency can issue a challenge that reaches to every school board, teachers' lounge, classroom and living room in America.

Second, a considerable consensus already exists that the President's principles accurately grasp the essence of the agenda that must be accomplished. Thus, there is less demand for the creation of the details of policy execution and more demand for the overarching vision that only the President can provide.

Third, a great deal of effort is underway already -- but it tends not to be widely known and information about current resources can be hard to come by. That means that a good deal can be accomplished through non-federal efforts that explain the importance of educational technology to American citizens and that make information about existing activities more accessible -- if those efforts are connected to the message from the President and Vice President.

Fourth, considerable enthusiasm exists for further efforts -- from businesses, educators and parents. Many high-technology businesses have included educational technology in their business plans because they see a growing market for technology hardware and educational materials. Some of those, and some others, are willing to pledge public-service activities around the nation, such as the NetDay 96 effort (announced by the President in September) that will connect 20% of California classrooms by the end of the school year. Educational associations, local school officials and teachers' groups are also ready to do more along the lines of what the President already announced -- the creation of the U.S. Technology Corps and the American Technology Honor Society. And, of course, the federal government's actions will catalyze other efforts. For example, 500 public-private partnerships competed for the Federal Challenge grants to develop the next generation of learning tools. But -- and this is an important point -- we cannot expect to assemble on a single day in a single place all of the resources necessary to do the whole job (as it will be detailed in the President's national vision). The goal should be to assemble a critical mass of resources that, with the President's leadership and energy, will set off a chain reaction that propels the nation forward.

The opportunity is, therefore, ripe for the President to unveil his national vision as the launching pad for a national effort that will combine Presidential leadership with implementation in every community. Where, in the last century, neighbors came together to build a schoolhouse or raise a barn, Americans now can raise their schools to the technological level demanded by the next century.

II. Launching the National Report Card

The President's challenge to the nation -- that every student be technologically literate by the dawn of the 21 st Century -- provides the opportunity for the Administration to launch a national effort through a new kind of national mission -- one that is based on Presidential leadership and shared resources.

The President will announce that the administration will issue regular reports indicating how well the nation is advancing in the areas identified by the four pillars (computers, communication, educational content, teacher development) beginning with a benchmark report to be issued later this year. One could imagine a diagram in which the four pillars are filled as the goal is reached.

The President should also take the opportunity to highlight successful examples of education technology, showing how the four pillars combine to improve educational experiences around the nation.

The greatest obstacle to the implementation of the President's four pillars for educational technology (computers, connections, teacher development and educational content) is neither technological or pedagogical. It comes from the need to answer one question that will be posed

by taxpayers, parents, teachers and students in every community: "Why in a time of limited resources and numerous demands, should we make the special effort to ensure that our children can use technology to be better educated and to work and thrive in the 21st Century?"

Every time we answer this question, we should picture the President sitting at a table in a local school-board meeting room with a dozen parents, or in a teachers' lounge with overburdened teachers or in a classroom with students.

The President's answer should be communicated in multiple ways:

- Directly, with the bully pulpit of the Presidency,
- By example, through the development of critical pathways that demonstrate to these parents the concrete benefits that will flow to their children (including national recognition of educators, teachers and students who are outstanding in their effort to bring technology into their schools, federal programs that fight against informational apartheid and stimulate new, creative activities in local communities, and better sharing of information about current efforts.)
- Through the marshalling of private actions that will validate the President's direct message and demonstrate to communities that the President's goals are achievable.

The National Report Card will demonstrate a shared commitment to progress, as the grades get higher every year through efforts of all kinds. It will symbolize the neighborly pursuit of a shared responsibility.

III. Action Items for the Launch of the National Report Card

Each of these goals can be realized in January and extended in the coming months. (Attached is a tentative schedule of possible Presidential and Vice-Presidential events through May).

January 8-15: Videotaping the President and/or Vice President. The President's National Information Infrastructure Advisory Council will be releasing a 10-minute videotape (jointly produced by AT&T and Disney) explaining the benefits of the information highway that would be distributed nationally. It is possible, for example, that it will be made available to video stores across the nation for free "rentals" by the parents and that it be broadcast on cable television. We have been invited to contribute a 60-90 second statement from the President and/or Vice President that would close the videotape. This is an extremely good opportunity.

January 29-31: National Report Card. The Advisory Council is meeting in Washington to conclude its operations and issue its final report (which is generally supportive of the Administration's initiatives, although in some areas, particularly encryption, it will ask the Administration to change its policies). The Council is likely to take further action, as well, on its "Kickstart" initiatives, which are designed to boost citizen involvement in educational and other public-use technologies. The Advisory Council is itself a very distinguished and diverse group (co-chaired by Ed McCracken of Silicon Graphics and Del Lewis of National Public Radio) with which the President should meet.

Meeting with the Council also offers the opportunity for the President to create the National Report Card and to demonstrate great private-sector support beyond that of the Council for his national effort. The public and private initiatives that are being worked on now for possible inclusion support each of the President's four principles:

Content:

- A Presidential instruction to governmental agencies to provide their electronic information in a manner that is easily available and easily used by schoolchildren,
- Create a model for the procurement of educational software through the joint work of the Department-of-Defense schools and the Council of Chief State Officers,
- Introduce a White House educational software Olympics at the end of the summer in which students could compete using software systems developed over the summer by high-school students working with university teams,
- Announce a private-sector initiative to create new inter-active components that could be used by software developers, teachers and students to create new curricula, like an intelligent periodic table of elements,
- Announce a new charter for the nation's public broadcasting stations in which they pledge to continue to provide essential educational resources for all citizens using 21st century technology: "We will be the resource that all citizens, including students, parents, and teachers routinely seek out whether they are seated before a television or a computer screen, in a classroom, a library, a community center, at work or at home" [excerpt from their statement]. The new vision was created by the public broadcasting stations themselves.

Teacher Development

- A new federal matching program would assist school districts to raise the funds needed to train teachers, as well as to purchase new, multi-media computers,

- National teachers' associations will create the nation's first "Teacher Corps", which will recognize and assist those teachers who have, by developing their own technology skills, become a critical resource for the 90% of teachers who have not,
- AT&T is working to create a "Teacher and Technology" Summit that will bring together major companies that have launched teacher-training initiatives (such as Microsoft and U.S. West) with educators to discuss the future of private-public collaboration (perhaps in collaboration with a national teachers' summit being planned by the Department of Education),
- New accreditation and certification standards will be established by national organizations in order to ensure that teachers are technologically prepared,

Connections

- A new private-public effort, led by the Vice President, will connect every K-12 school in every empowerment zone,
- The successful implementation of California NetDay and the launching of NetDays in other states,

Computers

- A new federal matching program to support computer purchases by local school districts (described above)
- The federal government will donate, and will encourage private business to donate, millions of dollars worth of excess and new computer equipment to schools. Wherever possible, we must arrange for the upgrading of these computers to ensure that they have modern, multi-media capabilities. Voluntary private incentives might be created to encourage similar donations by businesses or consumers.

Each of these, and others, are in the process of being vetted and developed by the inter-agency working group on education technology.

Finally, the national roll-out could serve as the launching pad for a series of national communications efforts. That could include the publication by a number of national leaders of a "statement of principles" in support of the President's vision and plans for specific materials including: the AT&T/Disney videotape, a CD-ROM developed to display the President's vision, new cable programming and an instructional kit from the Software Publishers Association.

The purpose is not, of course, to simply announce a lot of activity. Rather, the release of the President's vision, supported by a statement of principles supporting the President's goals and concrete actions demonstrating how each of the four principles can be achieved, will demonstrate to the nation both the power of and the path towards the goal of technological literacy for all students.

Attachment I -- Proposed 1996 Schedule

- January 23: State of the Union -- reiteration of the President's challenge.
- January 30(?): National Report Card with President and Vice President
- February 17(?): Empowerment Zone conference at which the Vice President announces the voluntary, private effort that will connect every K-12 school in an empowerment zone, thus demonstrating the importance of preventing informational apartheid.
- March 9: The President, Vice President and senior Administration officials work with volunteers in schools in California on "NetDay 96" -- the fulfillment of the President's pledge of September 21, 1995, to connect 20% of California classrooms -- and engage in related activities to demonstrate the full scope of the President's vision.
- Mid-March: The President (and senior Administration officials) gives the keynote address at the conference of Nation's Governors organized by IBM and announces how the model of NetDay, along with the other private and public efforts he has announced, can transform the nation's schools, possible with the announcement of other state NetDays.
- May: The President and Vice President appear at the first "National Report Card" conference at which educators, teachers, parents, businesses -- and students -- assess the progress made by the end of the 1995-96 school year and announce further efforts at meeting the President's goals in conjunction with a technology fair that features leading uses of educational technology from around the nation.

~~Net Day?~~

MEMORANDUM

To: Deni Frand
 From: Gene Sperling
 Re: Options for Mr. Redstone's involvement in the President's Educational Technology Initiative
 Date: April 17, 1996

Tom - this is great
 Subj. A few suggestions
 follow. (LE)

As you know, ensuring that all of our children have access to educational technology is one of the President's top priorities. He believes that educational technology, used correctly, can help improve student performance, reduce drop-out rates and absenteeism, and help prepare our children for the workplace of the 21st century. Although technology is not the answer to all of the problems associated with our educational system, we think it can make a real difference. Already, teachers are using this new technology to increase parental involvement, exchange lesson plans, keep up with the latest developments in their field, and tailor the curriculum the needs of individual students. Students are using the technology to access digital libraries, take "virtual field trips" Mayan ruins or the bottom of the ocean, collaborate with their peers from all over the world on science projects, and publish their school newspaper on the Internet.

Clearly, the President's Educational Technology Initiative will not be a success without creativity and resources from the private sector. The White House is delighted that Mr. Redstone is interested in playing a leadership role. We would welcome the opportunity to work with him in any way that he feels is appropriate.

At your request, I have developed a list of ~~possible~~ private-sector led initiatives that Mr. Redstone might want to consider. The cost projections are based on the best data we have available, but should be viewed as rough estimates.

As we developed this list, we tried to describe potential initiatives that would:

1. **Significantly advance America's progress towards meeting the President's challenge in one or more of the 4 "pillars" (computers, networks, teacher training, educational software and applications);**
2. **Capture the public imagination because of its scope and vision. Our sense from talking to you is that Mr. Redstone was interested in a major project that would rise above the run-of-the-mill corporate philanthropy in educational technology.**

3. Leverage resources from the private sector and other stakeholders. This "leverage" could be done in a number of ways.

■ Mr. Redstone could define a large project, underwrite 10-20 percent of it, and help raise the rest. (Annenberg's challenge was a --)

■ He could help finance the deployment of educational technology in a particular city, and challenge other business leaders to launch similar initiatives in their communities.

■ He could help underwrite the capital costs associated with an educational technology initiative if the state and local school district was willing to commit to paying the operational costs.

■ *He could support* Some projects by their very nature are highly leveraged. *For example several* Some companies have gotten many students, teachers, and programmers involved in developing educational content by offering a small amount of prize money. *(Examples: DISCO Systems, Applied Network Services, Turner Broadcasting)*

What are inherent?

4. Promote partnerships between the business community, teachers, parents, and the community. One of the exciting things about NetDay, for example, was that 20,000 people volunteered to help install wire in California schools. Some parents were so appalled by the condition of their children's schools that we painted the walls, replaced the broken windows, and fixed the lighting. Many of the "human" connections that were made are lasting well beyond March 9th.

Attached are descriptions of some potential projects. Some of the projects (e.g. addressing all 4 pillars in a major U.S. city) require hundreds of millions of dollars. We are not suggesting that Mr. Redstone underwrite a project of this magnitude by himself, but he could serve as the "champion" that helps galvanize other members of the business community.

Other efforts would require Occasionally, relatively small amounts of money (e.g. \$100,000) *but* can be incredibly helpful. *This is because* the Department of Education, because of budget cuts, lacks discretionary funds to pay for conferences and other activities. *(Congress zeroed out 96 leadership funds.)*

Many of the companies that we are working with have established foundations to support educational technology. For a variety of legal reasons, it is often easier for us to work more closely with foundations. *These foundations are supporting professional development for teachers, school innovation and experimentation*

Please let us know if you need any additional information. I look forward to working with you on this important project. *with technology, and other very important activities.*

One example is the Secretary of Education's National Conference on Technology. Last year this conference convened teams of educators, business partners and state policy makers from every State. The result was development of state plans for technology and subsequent investment from state legislatures.

Project: Fund computers, teacher training, software, and network connectivity in all schools in one or more major American cities.

Description/rationale:

- Develop and fund comprehensive strategy that addresses all four pillars in one or more major American city.
- This would help address the "equity" issue -- the concern that this technology will result in polarization between information "haves" and "have nots."
- Cost for initial deployment (assuming either the "partial classroom" or "full classroom" models developed by McKinsey) is \$610 - \$965 per student. The on-going operations and maintenance cost is \$155-275 per student per year. The deployment costs would probably be spread over some period of time (e.g. 5 years).
- The "full classroom" includes 1 computer per 5 students, a local area network that connects all of the computers within the school, a high-speed connection (1.5 megabits/second) to the outside world, hardware equipment such as file servers, printers, and scanners, software and online service subscription services, and teacher training. The "partial classroom" model is similar to the "full classroom", except that only 50 percent of the schools would have computers.

do you mean classrooms?

[Tom - I would prefer full classroom model.]

Leverage

- Organize the business community in a given city (e.g. Los Angeles) to raise the money or provide the equipment and technical assistance. An organization called Smart Valley led by John Young is playing this role in Silicon Valley.
- Get a commitment from the state or local government to pay for recurring costs.
- Challenge other business leaders to play a similar role in their community.

Costs for illustrative major U.S. cities

	Students (x \$610-\$965)	
Atlanta	63K	\$38 - \$61 million
Boston	58K	
Cleveland	76K	
Los Angeles	660K	\$403 - \$637 million
New York	950K	
Philadelphia:	209K	\$177 - \$202 million

Project: Significantly expand training opportunities for teachers so that they feel comfortable using this technology in the classroom. Goal is to move teachers as far as possible along the following "skill stages":

- Entry: No experience, struggling to cope
- Adoption: Successful use at a basic level
- Adaption: Discovery of potential in a variety of applications.
- Appropriation: Mastery over the technology.
- Invention: Develops new learning skills using technology.

Options

- Train all [or some percentage] of the new teachers entering the workforce. This is roughly 4 percent of the total number of 2.5 million teachers, or 100,000. Assuming a cost of \$1,000 - \$2,000 per teacher, this would cost \$100 - \$200 million. \$2,000 pays for 2 weeks of intensive training with additional follow-up during the course of the school year.
- Train 10 percent of all new teachers, and give them a lap-top. In exchange, ask that they commit to train another 5 teachers during the course of the school year. Cost is \$30-\$40 million.
- Train every principal. This is important because the move towards site-based management makes principals key decision-makers in whether a school adopts educational technology. There are 84,000 public schools, so the cost would be \$84 million - \$168 million. Training all of the principals in California and giving them laptops would cost \$36-\$48 million.
- Finance a "raffle" for all teachers that sign up to be "21st Century Teachers"; those teachers that are already technologically literate that agree to improve their skills and to train another 5 teachers during the course of the school year. Assuming 100,000 teachers signed up, and you wanted every teacher to have a 1 in 20 chance of getting a laptop, this would cost \$10 million.
- Develop a high-quality video aimed at principals and mail to every principal in the country. Cost -- ??

Broadcast over cable. Need video and written supports materials (include state Report, for example).

training is to target new schools as they enter classroom. Might have a better impact if work with universities.

No one else is doing this high visibility

Project: Help sponsor an "Internet Schoolhouse" to expand Internet-accessible courseware and educational resources in different subjects. *

Description:

- Although there is a large and rapidly growing amount of educational material on the Internet, it is often poorly organized, of uneven quality, and offers spotty coverage of subject materials.
- Recently, there have been some efforts made to build partnerships between professional societies, professors, software developers, and high-school teachers to expand the availability of high-quality, peer-reviewed instructional material on the Internet in particular subjects.
- Some companies have sponsored efforts by museums to go on-line, or are making scientific instruments (supercomputers, radio telescopes) available for on-line use.
- The National Science Foundation, for example, is funding the creation of a Virtual Department of Geography. Over the next three years, more than 30 geography professors from around the country will develop interactive course modules covering the entire discipline. Because the professors are willing to donate their time, the cost of this project is only \$300,000.
- Experts believe that there is also a need to develop software "building blocks" that can be used for educational applications. These would include an intelligent periodic table of elements for chemistry, bilingual dictionaries for foreign language training, and 2-D and 3-D graphing tools for geometry and calculus. Widespread availability of these building blocks can dramatically reduce the time and cost required to develop educational applications.
- The Administration would also like to see "virtual office hours" sponsored by leading professional societies. This would allow professionals to take turns answering student questions, and in the process, build up useful databases of frequently asked questions.
- We believe that this is a very highly leveraged activity because (a) the distribution cost of making networked courseware to students is essentially zero; and (b) there is a tremendous opportunity to recruit volunteers such as professors.

Cost:

- Very credible projects could be started for as little as \$1-2 million per subject area.

Project: Fund university-based "centers of excellence" that would conduct R&D in educational technology.

Description:

- We are still at the beginning stages of understanding how technology can be used to make life-long learning more productive. More research is needed in areas such as:
 - Authoring tools [Reduce time and expertise required to develop multimedia applications];
 - Evaluation and assessment (what works);
 - Intelligent tutors for individualized instruction (program can tell what kind of mistakes a student is making);
 - Development of standards for reusable software "objects".
- This is also a "high leverage" activity. For example, the NSF-funded National Center for Supercomputing Applications developed Mosaic, the first graphical browser for the World Wide Web. Graduates from this program left to start Netscape, which now has a market capitalization of over \$4 billion!

Cost

- A high-impact program could be started with 5 centers, at a cost of \$500,000 to \$2 million per year over 5 years (\$2.5 to \$10 million). This could leverage efforts by the National Science Foundation to establish Centers for Collaborative Research on Learning Technologies.

Note: Roy Pea & Elliot Soloway's report for OTM (for my first technology study) make great arguments for such centers. They saw them as advancing in cognitive science, curriculum exp. by computer science & engineering.

- They were built around models of engineering, education, and computer science. Cost - at least \$1 million per year for 2 years for each center!

THE WHITE HOUSE
WASHINGTON

October 3, 1996

MEMORANDUM FOR GENE SPERLING
GREG SIMON
MIKE SMITH

FROM: PAUL DIMOND PD

SUBJECT: TECHNOLOGY LITERACY CHALLENGE

CC: LAURA TYSON
KEN APFEL
BARRY WHITE
JIM KOHLENBERGER

Attached is a good summary from Naomi Tinklepaugh in Barry's shop describing how the FY97 appropriation implements all of the key elements of the President's proposed Technology Literacy Challenge. As you will see, we have complete authority — and substantially all of the funding requested for the first-year of a five-year ramp-up — to implement the President's proposal.

This is tremendous launching pad for implementing the President's vision for using education technology as a lever to enable students to learn the skills they need to thrive at the dawn of the new century. DoEd is working on a draft application, to which OMB will give expedited review so that the process of preparing state plans and local innovation grants can begin by the end of the month. We also have in place a good cadre of private sector players who are prepared to announce that they will lead the campaigns in states and localities across the country to put up at least an equal private sector match.

Together with all of the Net-Days and other possible announcements described in Tom Kalil's previous memo, these affirmative bi-partisan congressional and private sector response to the President's Technology Literacy Challenge provide a unique opportunity for the President and Vice President to demonstrate how they are leading the country to the 21st century. Any announcement should highlight the success of the President and Vice President in providing the vision and leadership and successfully catalyzing the federal support, the private sector match, and a flexible process to enable states and local communities, teachers and schools, parents and students to join in new partnership to put the world's storehouse of knowledge and a brighter future at the fingertips of every child.

The successful launch of the Technology Literacy Challenge will begin the process of effectively increasing the capacity and commitment of schools to purchase educational technology and integrate it into the daily learning of students and teachers. The TIC will help schools become integral parts of a vibrant, expanding, and constantly improving market with decreasing costs — rather than the poor stepchildren or charity cases of the past. I believe that any Presidential announcement of a proposed direction for implementing the Universal Service Trust Fund should support this basic message and essential policy.

Education Technology

	FY95 Enacted	FY96 Enacted	FY97 Request	FY97 Enacted
Technology Literacy Challenge Fund	\$0.0 million	\$0.0 million	\$250.0 million	\$200.0 million
Local Innovation Challenge Fund	9.5 (19 awards)	38.0 (about \$23M for 25 new awards and; \$15M for continuations)	60.0 (about \$17M for 17 new awards; \$43M for continuations)	57.0
Reg'l Technical Assistance Centers	10.0	10.0	10.0	10.0
Federal Leadership Activities	3.0	0.0	5.0	0.0

Technology Literacy Challenge Fund

The President, last February, challenged the public and private sectors to collaborate with one another to help ensure that all children are technologically literate by the dawn of the 21st century, equipped with the communication, math, science, and critical thinking skills essential for success in the Information Age.

To help fulfill this challenge, the President announced a new \$2 billion, five-year Technology Literacy Challenge Fund that would provide formula grants to States to stimulate State, local, and private sector partnerships focused on fully integrating technology into teaching and learning. The initiative would also address the persistent inequities that must be eliminated in the distribution of up-to-date technology to schools if poor students are to be afforded the same educational opportunities as more advantaged students. The specific goals of the Challenge Fund include the following:

- to provide teachers with the training and support they need to help students learn through modern technology;
- to provide all teachers and students with access to modern computers in their classrooms;
- to ensure that every classroom is connected to the Information Superhighway; and
- to provide effective and engaging software and on-line learning resources that will be an integral part of every school curriculum.

Funding. The Technology Literacy Challenge Fund will provide grants to States under the authority of title III of the Elementary and Secondary Education Act. Each State will be eligible to receive a share of the total appropriation equal to its share of funds under part A of title I, except that no State will receive less than one-half of one percent of the appropriated amount. States will use their funds to award grants, on a competitive basis, to local school districts. States will have maximum flexibility to accomplish the goals outlined above and, in order to receive funds, will have to meet only three requirements:

- **State Strategy:** develop a strategy that enables every school in the State to meet the four goals by the dawn of the 21st century, complete with benchmarks and timetables set by the State;
- **Private Sector Partnership:** demonstrate significant private-sector participation and commitments that should at least match the amount of Federal support; and
- **Annual Progress Report to the Public:** ensure accountability by publicly reporting at the end of every school year on how it will achieve its strategy in the most cost-effective manner and on progress made in achieving its benchmarks.

Challenge funds may be used to: acquire hardware, software, and connectivity linkages; provide professional development in the integration of technology into the curriculum; and develop applications of technology to support challenging learning activities and opportunities for all students.

To ensure that Indian reservations are allocated an appropriate level of funding, the FY97 appropriations language includes a provision that sets aside one-half of one percent of the amount available for this program for the outlying areas to be distributed based on their relative need as determined by the Secretary.

The Secretary will give priority in the award of these funds to the districts with the best plans, enrolling the largest concentrations of poor students, and demonstrating the greatest needs for technology.

Local Community Challenge Option. Districts in States that choose not to participate in the program (if there any such States) will not be precluded from benefiting from the Challenge Fund. The FY97 appropriations language will allow the Secretary of Education to reserve the funds of any States that choose not to participate in the program (rather than reallocating them among other States) and to provide districts in the State with the opportunity to compete for a share of the funds. In the event a State's funds are reserved, the Secretary will announce a competition in the *Federal Register* restricted to school districts in that State. In order to compete, districts will have to meet the three requirements otherwise required of the State, but for the respective district only, i.e., a district strategy, private sector partnership, and annual report to the public.

Reassessment and Review. The Technology Literacy Challenge Fund will provide funding for five years, then be subject to a sunset provision to allow a review of what has been accomplished and a reassessment of whether it is still necessary, and if so at what level of funding.

Impact of FY97 appropriations. Although the Administration requested \$250 million for the Technology Literacy Challenge Fund, FY97 enacted only provides \$200 million which means that the formula grants that States receive will be smaller than they would have been otherwise.

Local Innovation Challenge Fund

The funds requested for the Local Innovation Challenge Fund will complement funds made available to States under the Technology Literacy Challenge Fund, by providing five-year competitive awards to consortia that include poor school districts to develop innovative applications of technology. The State grant funds will help build the infrastructure for integrating technology into every classroom. These funds will help show the way by supporting partnerships of business, industry, and local schools that propose innovative approaches to improving students' (including adult learners') achievement with technology, whether through classroom applications for students, new hardware, better software, the development of new network products for school use, or new and more effective approaches to professional development. The result should be innovation and models from which communities across the country can benefit. The demonstration of strategies and new uses of technology will complement the Technology Literacy Challenge Fund.

Funding. FY97 funding will support both ongoing projects and new awards. The initial technology challenge grant competition in 1995, originally referred to as the Technology Learning Challenge (TLC), attracted over 500 applications, many of which were the work of coalitions of businesses and telecommunications providers working with schools, universities, and other community learning centers. The 1996 competition attracted 586 applications, about 130 of which were submitted by applicants rejected in the first round. In 1995 19 grantees received awards, in 1996 25 grantees will receive new awards; and in 1997 about 17 grantees are expected to receive new awards.

Impact of FY97 appropriations. Although the Administration requested \$60 million for the Local Innovation Challenge Fund, FY97 enacted only provides \$57 million which means that rather than issuing about 17 new awards, the Department of Education will only be able to issue about 14 new awards.

Federal Leadership Activities

Impact of FY97 appropriations. Although the Administration requested \$5 million for Federal Leadership Activities (for conferences and workshops), during the final negotiations the Department of Education decided to not include appropriations language for this activity in the final conference agreement and to not push for the funding (the Department backed out of pushing for this funding in FY96 as well).

Summary of Childrens' Provisions in Telecom Reform Bill:

(1) The Snowe-Rockefeller provision requires telecommunications service providers to give schools discounts sufficient to make service affordable (FCC will define the level of discount). Providers will be reimbursed out of the universal service fund.

(2) The Universal Service Principles of the bill are very few (seven or eight). One of these is the principle that kids in classrooms should get access to advanced telecommunications services.

(3) The Educational Technology Corp provision authored by Senator Moseley-Braun would make eligible for federal funds an existing non-profit organization. This entity would fund educational technology and serve as a clearinghouse. The technology corporation receives no funding in this bill and probably won't anytime soon.

(4) The Internet Indecency provision prohibits the sending of indecent content to minors or display of such material in a manner available to minors. The Commission's is given authority under the provision to describe effective new content screening technologies. Use of an FCC-recommended technology is admissible as evidence that a provider of indecent content qualifies for a "good faith efforts" defense to prosecution.

(5) The V-Chip provision gives the cable and broadcasting industries one year to develop rules for rating video programming containing violent, sexual, or indecent content. If the industries fail to develop rules, the FCC is given authority to create an advisory committee to recommend a system for rating. The FCC is given authority as well to prescribe rules requiring a distributor to transmit a rating to television receivers for blocking if the distributor has rated a video program.

The legislation requires that all sets over a certain size include the blocking feature -- in compliance with Commission rules.

(6) Creation of a technology fund by industry -- to "encourage" TV and electronics equipment manufacturers to facilitate the development of blocking technology -- is "encouraged" by the legislation.

(7) Cable provisions increase the maximum fine for transmitting obscene programming on cable from \$10,000 to \$100,000; requires cable operators to block programming upon subscriber request; requires cable operators offering indecent programming on sex channels to block such programming so that non-subscribers don't receive it.