

Attachment 3 Federal Programs

GOALS 2000: EDUCATE AMERICA ACT

PURPOSE:

- * Goals 2000, the administration's framework for education reform, is designed to provide resources to states and communities to develop and implement comprehensive education reforms aimed at helping all students reach high academic and occupational skill standards.
- * Key provisions include the establishment of national education goals, national education reform leadership, and standards & assessments of educational progress, the systemic improvement of State and local education, strengthening of parental involvement, and the formation of the National Skill Standards Board.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- * Title III technology grants are awarded to SEAs for integrating state-of-the-art technology in State educational improvement plans.
- * Electronic networks can strengthen communication among educators, expand professional development opportunities, and support the development and implementation of content and performance standards by allowing teachers and other educators to converse with one another across states.
- * Technology is a powerful resource in raising the motivation and performance of all students.
- * Students must have technologies to enhance their learning and to master skills necessary for the workplace.

ACTION NEEDED

- * Goals 2000 should be the guiding vision for the Challenge Grants and the TLC. The grants will support models to demonstrate applications of technology that complement local educational improvement efforts. States would be encouraged to consider the Challenge Grants as models to adapt in developing Goals 2000 sub grants and other programs related to Goals 2000.

SCHOOL-TO-WORK OPPORTUNITIES

PURPOSE:

- * Creates, through seed capital grants to State/local partnerships coupled with technical assistance, school-to-work opportunities systems. Such systems must: (1) be part of comprehensive educational reform, (2) integrate Goals 2000 and further the national education goals, (3) Integrate academic and occupational learning, (4) integrate school-based and work-based learning, (5) provide performance-based opportunities for all students.
- * Helps youth acquire knowledge, skills, abilities, and labor market information needed to make a smooth and effective transition from school to career-oriented work and to further education and training.
- * Requires every school-to-work system to contain three core elements: (1) School-based Learning (2) Work-based Learning, and (3) Connecting activities.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

Being conversant with technology is a necessary precondition to developing high skills, which in turn, leads to high wages. The program can link schoolroom and workplace geographically and in subject matter content. It can also provide innovative, self-paced curriculum/instruction as well as creative and valid means for measuring performance against industry skills standards. Students can be assisted working with labor market information in order to identify possible career choices by the 11th grade. The availability and distribution of work-based learning opportunities, industry mentors and other connecting activities as defined by the Act can be managed.

ACTION NEEDED

- * Promote, encourage, and "incent" the use of learning technology through subsequent State and local solicitations for grant award to a greater extent.
- * Focus technical assistance and research more heavily on the application of learning technology.
- * Fund and operate pilot demonstrations (focused primarily on technology application) "National Activities" funds would need to be substantially increased.

PERKINS VOCATIONAL AND APPLIED TECHNOLOGY ACT

PURPOSE:

- * Seeks to ensure that, by the year 2000, every adult American is literate and possesses the skills necessary to compete in the economy and lead productive lives. The FY 1995 budget includes \$1.1 billion.
- * Supports State and local efforts to establish and operate programs that provide American business with the technologically skilled and adaptable workers needed to compete in a global economy. The populations assisted range from secondary students in pre-vocational courses through adults who need retraining to adapt to changing technological and labor market conditions. Tech-Prep education supports planning and demonstration grants to consortia of local educational agencies and postsecondary institutions to provide high school students with mathematics, science, communications, and technological skills.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- * It is estimated that three-fourths of the individuals entering the American workforce between now and the year 2000 will have limited verbal and computational skills, while most new jobs during that period will require increasingly complex skills to meet the technological demands of the workplace.
- * With the American economy in transition, increasing global challenges to our economic competitiveness, and more jobs requiring a high level of technical expertise, our employment and training systems must produce greater numbers of technologically skilled and adaptable workers than in the past.
- * Because changes in Federal defense policy is resulting in thousands of dislocated workers, aggressive steps are being taken to address this issue, including the development of specialized training programs, support for innovative demonstration projects, and collaborative efforts with an emphasis on technology transfer from defense to private sector. Much coordination will occur with the School-to-Work initiative.

ACTION NEEDED FOR 1996:

- * Support for effective technology applications should be considered during the FY 1996 reauthorization process in the fall of 1994.
- * Effective uses of technology, including distance learning for rural areas, provision of labor market information via electronic networks, and greater emphasis on contextualized learning through simulated work environments, could be integrated into the existing program.
- * Innovative uses of Perkins funds at the state and local level could be examined and promoted as national models.

HEAD START

PURPOSE:

- * Provides services to economically disadvantaged preschool-aged children and their families to help prepare for life and for school. The program currently serves about 720,000 children. In addition to a developmentally appropriate curriculum for the education component, the program provides health and nutrition services, social services, parent involvement services, and some programs receive special funding to provide services to the parents in the areas of employment, literacy and substance abuse prevention.
- * Is a community-based program sponsored by about 1400 grantees and 600 sub-grantees (who may be public or private non-profit agencies). Funding (\$3.3 billion in FY 1994) is provided directly from Federal Regional offices to the grantees without State involvement.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- * as a teaching device in the classroom. A number of programs have used computers in the classroom, including participation in a demonstration project funded in part by hardware contributions from IBM. Head Start is involved in the planning and field testing of PBS's Ready to Learn program.
- * as a way of training classroom teachers. a satellite training program for Head Start programs in remote areas has been successfully developed and implemented.
- * as a resource to Head Start programs. A national bulletin board system (BBS) is currently in use. Head Start may be part of a national interactive information system in conjunction with the National Head Start Association and the Department of Commerce.
- * as a learning tool for parents. Grantees are currently using a variety of applications in teaching literacy, providing job skills development training, and parenting skills.
- * as a tool to reach special populations. Head Start funds three demonstration programs to explore the use of technology to meet the needs of children with disabilities.

ACTION NEEDED: Head Start has ongoing programmatic authority for research, development & evaluation, as well as for training and technical assistance to grantees. Both of these authorities should be used for technology applications.

JOB CORPS

PURPOSE

Job Corps is a major national training and employment program administered by the Department of Labor to address the multiple barriers to employment faced by disadvantaged youth throughout the United States. Its programs are open-entry, open-exit and individually-paced.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

Job Corps has developed a Computer Managed Instruction system to eliminate many of its manual records, and has developed a telecommunications network connecting critical Job Corps management and support functions. As a part of these planned FY 95 measures, Job Corps plans to use Department of Defense learning technology by:

- * Accommodating learning technology into future software development,
- * Reviewing DoD training materials for adopting into Job Corps curricula (if appropriate), and
- * Including the potential use of learning technology in all Job Corps classrooms, shops, dormitories and offices as part of all future procurement.

ACTION NEEDED FOR FY 1996

Since the current Job Corps budget can not accommodate a valid pilot effort, \$1,250,000 from sources other than the Job Corps budget are needed. If funds were made available, pilot centers could then begin full operation in early 1996 to:

- * Integrate workplace, vocational and education skills and allow centers to tailor a comprehensive training plan for each student,
- * Integrate traditional and computer-based instruction in all training areas,
- * Provide "learning on demand" for vocational students as they work on training projects, and
- * Allow students to access interactive training programs during evenings and weekend.

ESEA TECHNICAL ASSISTANCE CENTERS

PURPOSE:

- The 10 ESEA Technical Assistance Centers, to be authorized under the new ESEA legislation, are designed to create a national technical assistance and dissemination system to help states, districts, tribes, and individual schools to use federal education dollars in the most effective way possible, including implementing promising and proven practices for improving teaching and learning. Contracts for these centers will be awarded in FY 1995.
- The Technical Assistance Centers will be required to maintain expertise in, and provide support on, all ESEA programs, including Title I, bilingual education, technology for education, and other areas.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- Technical Assistance Center staff can help ensure that effective technology tools, such as software, networks, digital libraries, and voicemail systems, are fully considered by education leaders as tools for school improvement.
- TAC staff can help states, districts, and schools to plan for the use of technology.
- TAC staff can help educators to identify innovative funding strategies for technology, including the use of federal program funds.

ACTION NEEDED FOR 1996

- Identify greatest needs in states, school districts, schools, and other learning sites.
- Develop criteria for the capacity and expertise in technology that each TAC should have and incorporate them into the centers' required activities.
- Ensure that technology for education is a priority area for the TACs.

EISENHOWER PROFESSIONAL DEVELOPMENT PROGRAM

PURPOSE:

- * Provides financial assistance to State educational agencies, State agencies for higher education, local educational agencies, and institutions of higher education to:
 - o provide access to high-quality professional development aligned to challenging State standards and
 - o support sustained and intensive high-quality professional development activities in the core academic subjects.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- * Teaching to high standard for all children requires the use of innovative and varied strategies, including technologically-oriented ones. Appropriate training would allow teachers to access a wide variety of technologically-oriented teaching strategies.
- * Training teachers in the use of technology enables them to expand their own content and pedagogy knowledge through access to network sources.
- * Training teachers in network communications and establishing interactive networks, of teachers enhances professionalism to teaching and promotes teachers' responsibility for their own professional growth.
- * LEAs use their funds to support any professional development activity consistent with the plan they submit to their State. Activities such as any of the above would be eligible activities.
- * IHEs compete for funding to offer programs to elementary and secondary teachers; the above types would be eligible.

ACTION NEEDED

- * The requested appropriation increase, coupled with required local match, would provide LEAs with the opportunity to begin a program of high-quality, intensive professional development in the utilization of technology.

COMPENSATORY EDUCATION (CHAPTER 1)

PURPOSE:

- * Provides approximately \$7 billion to local education agencies to improve the educational opportunities of educationally deprived children in high poverty schools by helping those children to succeed in the regular classroom, attain grade-level proficiency, and improve achievements in basic and more advanced skills.
- * Funds are concentrated on elementary schools, although there are programs from pre-school to high school. The Chapter 1 program has national scope, serving more than 6 million children in over 53,000 schools.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- * Technology is now a central part of the way Chapter 1 funds are used. Approximately 15%, or \$400 million, in Chapter 1 money supports school purchases of computer equipment, hardware, and software. However, schools typically purchase computer laboratories that provide only limited access to resources and are used to operate software that drills students on basic skills. Schools are not typically linked to resources outside the school, such as Internet.
- * Technology could more effectively advance Chapter 1's mission by supporting connections to networks and by supporting instructional applications of higher quality.

ACTION NEEDED:

- * Develop strategies to increase effective technology use with Title I funds during FY 1995 implementation. Develop a vision statement for how Title I will support the NII and learning technologies.
- * Develop a strategy to communicate with state and local program administrators - who have some influence over how program dollars are spent - on effective uses of technology.
- * Develop means of ongoing technical assistance for the use of technology in Title I.
- * Explore the possibility of including technology as a priority area in the award of demonstration grants.

NIST MANUFACTURING EXTENSION PROGRAM

PURPOSE:

- * Help small manufacturers become more competitive by implementing appropriate advanced technology, best manufacturing practices, and modern business and workforce approaches.
- * Build a network of 100 manufacturing extension centers across the nation by 1997 to work directly with companies to deliver information and technical assistance on technology transfer and best practices.
- * Coordinate with state manufacturing extension, economic development, and technology programs to ensure consistency of approaches.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

The MEP is already linking the manufacturing extension centers electronically and planning to use technology for disseminating information to companies -- i.e., through two-way video teleconferencing and other distance learning methods. The Department of Labor is working with the NIST/MEP to build workforce training and workplace modernization into the services delivered by manufacturing extension centers. Information and technical assistance in these areas could be delivered through the emerging MEP electronic network. A logical next step would be for the extension centers to develop electronic linkages with individual companies, universities, community colleges, libraries, and other points of access.

This network also could promote the use of new learning technologies as part of the training and workplace modernization services provided by extension agents.

ACTION NEEDED FOR 1996:

- * Develop electronic linkages between extension centers and individual businesses, universities, community colleges, and other points of access.
- * Integrate new learning technologies into current curricula and provide information to companies on new learning technologies.

REGIONAL EDUCATION LABORATORIES

PURPOSE

The ten Regional Education Laboratories provide information and services - including publications, policy reports, teleconferences, technical assistance, training, and online information systems - to state and political education agencies. Each laboratory serves a group of contiguous states and is governed by a board with representatives from the political, business, and education communities of the states they serve.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

Each regional laboratory offers resources to support planning and technology implementation, including research on telecommunications use, planning assistance, information databases, professional development, and in some cases, technical assistance to states and districts.

The laboratories are establishing a nationwide Internet-based online resource network that would provide education communities in all states with information and resources.

ACTION NEEDED

- The laboratories should continue to expand their nationally information network and its linkage to education agencies.
- The laboratories should support state education agencies and school districts in technology planning and in connecting to the NII.
- The laboratories should expand their R&D efforts to include the impact of technology on state and national education reform.
- The laboratories should expand their efforts to provide services as a one stop information resource for the effective applications of technology to support teaching and learning and achievement of the national education goals.
- The laboratories should be used as a regional link from the federal agencies to the local agencies to support the implementation of national reforms such as Goals 2000 and the Technology and Learning Challenge.
- The laboratories should work with schools and communities to establish student information systems between schools and community agencies.

SPECIAL EDUCATION

IDEA

PURPOSE:

- Provide free appropriate public education (FAPE) for each child with a disability and procedural due process safeguards. Grants are provided to States, Chapter 1 handicapped programs, preschool programs, and programs for infants and families.
- Assist States in meeting the costs of providing special education and related services to children, aged 3 through 21 years, with disabilities.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- Technology combined with instruction can improve outcomes for children with disabilities by supporting student learning, classroom instructions, and teacher development and support.
- Notable technology applications currently operating and being developed include captioned programming, recording textbooks for the blind on tape, virtual reality, and integrating instructional technology into the classroom.

ACTION NEEDED FOR 1996

- Additional appropriations and expanded program authorization are needed to develop technologies to enable students with disabilities to achieve better outcomes in schools and lead productive lives in a competitive work environment.

SPECIAL EDUCATION

TECHNOLOGY, EDUCATIONAL MEDIA, AND MATERIALS PROGRAM FOR INDIVIDUALS WITH DISABILITIES

PURPOSE:

- Invests in research, development, evaluation, and promotion of the use of technology tools for students with disabilities. Efforts include the promotion of literacy, study of education innovations, improvement of software design and the use of assistive technology with children.
- Sponsors "futures" projects to examine trends, studies how technology used in business or military environments can be adapted for children with disabilities, and supports multi-media instructional design. Two marketing and dissemination technology centers are sponsored.

HOW CAN TECHNOLOGY ENHANCE THE MISSION

- Technology allows children with disability to function with a natural and comprehensive curriculum and to learn as well as their peers.
- Technology is able to assist a child or adult with disabilities in everyday functions that lead to living independently at home and in maintaining a job.
- Technology that assists children with disabilities in classrooms and in living situations has also been found very helpful in learning for non-disabled children in school.

ACTION NEEDED:

- Technological activities need coordination and focus to national initiatives in regular education if their full value to learning for all children is to be realized.

SPECIAL EDUCATION

TECHNOLOGY-RELATED ASSISTANCE FOR INDIVIDUALS WITH DISABILITIES ACT OF 1988 AS AMENDED IN 1994

PURPOSE:

- Supports systems change and advocacy activities to assist States to develop and implement consumer-responsive, comprehensive programs of technology-related assistance for individuals with disabilities of all ages.
- Supports model demonstration direct service projects, activities that increase reliable and durable technology, participation of people with disabilities in testing technology, making common technology accessible to people with disabilities, and technology transfer.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- Assistive technology devices and services enable individuals with disabilities to have greater control over their lives, participate in activities in home, school and work environments and benefit from opportunities taken for granted by individuals with no disabilities.
- Assistive technology devices can be used to increase the involvement of individuals with disabilities in, and reduce expenditures associated with, programs and activities such as early intervention, education, rehabilitation and training, employment, residential living, independent living, recreation, and other aspects of daily living.

ACTION NEEDED:

- Technological activities need coordination and focus to national initiatives in regular education if their full value to learning for all children is to be realized.

SPECIAL EDUCATION

CAPTIONED FILMS, TELEVISION, DESCRIPTIVE VIDEO AND EDUCATIONAL MEDIA

PURPOSE:

- Captioning and distribution of educational, general interest and special interest films and videos.
- Closed-captioned television programs which include: news and public information, children's, prime-time, sports, syndicated, daytime, and local programs;
- Recording for the Blind, Inc., audio cassette loan program;
- Video description for broadcast and cable television, and home video;
- Research, development and evaluation of captioning technology in educational, social and cultural settings.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- Without assistive technology persons with sensory disabilities will experience an ever widening educational, cultural and social gap with non-disabled individuals.
- The technology which assists persons with sensory disabilities can also assist many others, such as those with learning disabilities, partial sensory impairments, etc.
- Technology makes the world more accessible to individuals with disabilities.

ACTION NEEDED

- A TLC initiative can utilize this program to inform customers of these services, and to assist in making any demonstrations accessible to all children and adults, regardless of disability.

SPECIAL EDUCATION

SMALL BUSINESS INNOVATIVE RESEARCH

PURPOSE:

- Agencies are required to establish SBIR programs by reserving a statutory percentage of their extramural research and development budgets to be awarded to small business concerns.
- The award is provided in two phases. The first is for the development of the specifications for the requested project and/or a prototype and a marketing/dissemination plan. The second phase assists the grantee in preparing the product for market and for the beta testing of the product.

HOW TECHNOLOGY CAN ENHANCE THE MISSION

- This program has been prioritized with assistive technology parameters.
- Because of the annual nature of priority setting, such priorities could be set to articulate to national initiative in technology and learning and create a market for such technology.

ACTION NEEDED

- Careful planning and coordination with the TLC could make initiatives commercially viable.

ONE STOP CAREER CENTERS PROGRAM

PURPOSE:

- * Create a nation-wide "reemployment system" to serve the employment and training needs of all Americans, and encourage innovation in the delivery of services and information.
- * Bring together information on a full array of employment-related services available to both job seekers and employers, and integrate delivery of all Department of Labor funded employment and training programs, as well as other employment and training programs, into the one-stop career center.
- * Deliver high quality employment and training services to all Americans to permit them to manage their working lives more effectively.

HOW TECHNOLOGY CAN HELP ENHANCE THE MISSION:

- * Provide lower cost, self-paced training and basic and occupational skills assessment.
- * Provide central access to information on program eligibility and assistance in enrolling in programs.
- * Assist workers seeking new jobs, first jobs in using comprehensive labor market information in order to identify possible career choices, job skill requirements and training options.
- * Provide tools for extracting information from various electronic labor exchanges as additional sources of information on labor markets and emerging skill trends.
- * Create communication links between the states and local labor market outlets to allow quick transfer of standard labor market information and to permit the operation of nation-wide job and talent banks.

ACTION NEEDED:

- * To promote, encourage, and "incent" the use of learning and other technologies through subsequent State and Local solicitation for grant award to a greater extent.
- * To focus technical assistance and research on the application of learning technology in the one-stop context.
- * To fund demonstrations of local learning labs to operate pilot technology centers for possible replication.

Attachment 4 R&D Focus Areas

Technology Learning Challenge R&D Agenda Focus Areas

- Undertake basic research on learning and cognitive processes
- Develop new models to evaluate learning productivity
- Develop high-quality, affordable learning tools
- Demonstrate innovative technology and networking applications

Attachment 5 Demonstrations

CANDIDATE DEMONSTRATIONS

TARGET GROUPS	GOAL	KEY FEATURES	LEAD AGENCY
PRE-SCHOOL	All students start school ready to learn	An evaluation of the effectiveness of "edutainment" software to teach fundamental skills	DoEd
GRADES K-8	All students leave grades 4, and 8 having demonstrated competency over challenging subject matter...	A cost-effectiveness assessment of interactive courseware and distance learning to improve core skills	DoEd
GRADES 8-12	Every school in America will ensure that all students learn to use their minds well so they may be prepared for responsible citizenship,...	A study of the ability of interactive multimedia and synthetic environments to enhance learning across knowledge domains and reform traditional education	DoEd
VOCATIONAL ED	Increase opportunities of all U.S. high school graduates to obtain meaningful employment	An evaluation of the benefits of using interactive courseware and distance learning to improve job entry skills	DoEd/DoL
HIGHER EDUCATION	Create exciting new environments for university research, exploration, and learning	A cost-benefit study of the use of models and simulation to advance the quality of higher education and research	DoEd
INCUMB WORKERS	Enable workers to acquire new skills needed in the 21st century	A cost-benefit study of the use of distance learning and just-in-time training technologies	DoL/DoD
MIL PERSONNEL	The U.S. military shall be the best equipped, trained, and led fighting force in the world	A evaluation of the capabilities and limitations of advanced simulation and distance training to transform the traditional training infrastructure	DoD

DRAFT

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 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 instruction even with little or no federal assistance.

The grants would cover content (e.g. software that allows learners to experiment and play with ideas in simulated environments) not hardware. Funding for hardware would be provided by the proposal team (state and federal funding from other programs would be eligible)

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 participants: school systems, colleges and universities, local businesses, content 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 approach for using technology to advance lifelong learning goals: school-to-work, goals 2000, higher education, incumbent worker training?
- is concept exportable to other communities?
- is it a part of a comprehensive community plan for education and training, will it continue to be supported by the community as an integral part of its instructional programs?
- what is the extent of cost-sharing offered by the partners?
- What evidence is there that the proposed program will succeed, what benchmarks will be established, and how will progress toward the goals will be evaluated?

How Much Would It Cost:

The central question is how large a grant would be needed to get a community to make the effort to craft a proposal and plan?

A representative estimate is that an adequate program would be

7-12 grants for \$5 million/year for 4 years

75-200 grants for \$200 thousand/year for 4 years

total: \$50-100 million/year

Existing Funding Available:

ESEA is likely to receive \$20-50 million in FY95 for education technology. The program is likely to be limited to education for grades 1-12 (including school to work but not adult training); a series of formulas may further restrict use.

Funding Options

We assume that however the program is funded it would operate under the umbrella of an interagency coordination team (including DoED, DoL, DoD, DoC, NSF). Funding options are as follows:

Option (1) Direct all funding to ARPA in DoD

Pro:

- comparative ease of adding funding in an agency
- strong program management abilities
- proven track record in technology for learning

Con:

- education not central to DoD mission
- not consistent with shift to civilian R&D
- links to ESEA program 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

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 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
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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, agriculture, 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 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 (the group suggests 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. An 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).

Attachment 1 Vision Statement
Attachment 2 Rivlin Memo
Attachment 3 Federal Programs
Attachment 4 R&D Focus Areas
Attachment 5 Demonstrations

DRAFT

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

August 11, 1994

The ETR is preparing options for a national program aimed at using the power of modern information technology to achieve the Administration's lifelong learning goals -- specifically 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 principles on a series of issues that must be resolved in the relatively near future. A draft of the decision document 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 environment 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 showing great success. Investment in the development of high-quality learning systems, 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 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 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 establishes a White House Task Force to explore opportunities for technology and learning.
2. OMB and NSTC, working in cooperation with ETR, issue guidance asking agencies to give high priority to technology and learning in their research budgets on May 6, 1994.
3. DoD hosts a workshop for Deputies on July 9th and a consensus vision statement (attachment 1) is developed.
4. A series of interagency working groups are charged with addressing specific issues. They are 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 Technology 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

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 4) 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 of the 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, agencies will include elements of a coordinated technology and learning program in their FY96 budgets

ETR task force will continue to define programmatic decisions and options aiming to complete the analysis by November 4.

Outreach efforts will solicit advice and guidance from businesses, NGOs, state and local governments and, following the announcement of the program, help to ensure wide national participation in the programs and enthusiasm about its 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.

Analysis is underway in each of the following programs: (summaries of the work are attachment 3)

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
	Job Corps
	Technical Assistance Centers established in the 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 1 of the Elementary and Secondary Education Act of 1965 (1994 amendments pending)
One-Stops	
Individuals with Disabilities	Technology, Educational media, and materials program for individuals with disabilities, Part G of the Education of the Handicapped Act 1986 Technology-Related Assistance for Individuals with Disabilities Act of 1988 as Amended in 1994 Captioned Films, Television, Descriptive Video and Educational Media in Part F of the Individuals with Disabilities Act National Institute on Disability and Rehabilitation Research in the Small Business Innovation Development Act of 1982
NIST Manufacturing Extension Program	Omnibus Trade and Competitiveness Act of 1988 (1994 amendments pending)

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 of 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 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 competing 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 protection 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 telecommunications 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 authorities resources potentially available from pending legislation for ensuring universal access, model practices, 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.

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- ② $\overline{G+H}$ - Portfolio
- ③ Outreach
- ④ $\overline{G+H}$ - Portfolio

1

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:

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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).

THE WHITE HOUSE
WASHINGTON

August 5, 1994

**MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND
AGENCIES AND THE NATIONAL SCIENCE AND TECHNOLOGY COUNCIL
COMMITTEE CHAIRS**

FROM:  Alice Rivlin and Jack Gibbons 

SUBJECT: FY 1996 R&D Data Collection and Review

On May 6, 1994, we sent the agencies a memorandum outlining the FY 1996 research and development (R&D) policy principles and priorities. It is expected that the agency FY 1996 budget requests will support these principles and priorities and do so within the budget totals received from OMB. The purpose of this memo is to provide you with the additional process and reporting information that was mentioned to be forthcoming in the May 6th memorandum.

Since the transmittal of the May 6th memorandum, we have been considering the most effective and least burdensome way of collecting and reviewing the agency's responses to these R&D policy principles and priorities. Outlined below are the roles and expected products from the agencies and the NSTC committees in collecting, analyzing, and reporting FY 1996 R&D data. Several priority areas were selected for formal interagency assessments in FY 1996 (see section 3). Although the other R&D priority areas mentioned in the May 6, 1994 memo are still considered very important and information is being requested for them (see section 4), it was judged that they were not ready for a formal, interagency budget analysis during the development of the FY 1996 budget. The FY 1996 R&D data collection and review process components include:

1. Basic, Applied, and Development R&D Totals. As has been done for many years, agency totals will be collected electronically through OMB Circular A-11 44A R&D Exhibit. Exhibit 44A has been updated this year to include data collection on merit reviewed scientific research with peer review evaluation and competitive selection. This data will be due September 29, 1994. Agency's current Exhibit 44A Point-of-Contacts will be provided with instructions in mid-September on how to input this data electronically into the OMB's MAX computer system.
2. Agency R&D Total by Program/Project. Agency R&D totals will be collected at the program/project level. This data collection will be arranged on an agency-by-agency basis to reflect the most efficient format and structure for collection. OMB staff will

be contacting agency budget offices directly on how to respond to this component. This data will be due September 29, 1994.

3. Priority Assessments and Budget Analysis. The NSTC committees are being asked to provide OMB and OSTP by September 29, 1994 with a 5-10 page summary of the following priority areas:

Priority Area

Environment and Natural Resources
High Performance Computing and
Communications (HPCC)
Partnership for New Generation
Vehicle (PNGV)
National Electronics
Manufacturing Initiative
Learning Productivity
Building and Construction
Transportation Physical Infrastructure
Peacekeeping, Special Operations,
and Low Intensity Conflict

NSTC Committee

Environment and Natural Resources
Information and Communications R&D
Civilian Industrial Technology
Civilian Industrial Technology
Education and Training R&D
Civilian Industrial Technology
Transportation R&D
National Security

We request that all agencies provide the Chair of the appropriate NSTC Committee with your agency's contributions to these assessment areas. Agencies must be responsible for ensuring that the budgets proposed to these committees represent the views of the agency's senior management, are consistent with OMB budget guidance, and are highlighted in their agency's budget submittal to OMB on September 9, 1994.

The summary must include a description of each assessment area's budget and describe how important goals and policy issues are addressed, including a strategy to measure the progress and performance of achieving these goals. It should also identify any funding shortfalls associated with important policy issues and provide options on how they can be accommodated within the agency budget totals. The summary should also include a list of agency programs within the assessment area. Two funding options should be provided, one at the total FY 1995 enacted levels or best current estimate of anticipated enacted level (i.e., level funding between FY 1995 and FY 1996), and another at the total FY 1996 agency request levels. It should be clear how these options differ in achieving the overall goals of the assessment area.

Each Committee will transmit to Committee members further instructions that clarify the content, format, process, and internal schedule to meet the September 29, 1994 deadline. Where useful and appropriate, Committees should review agency contributions prior to September 9, 1994 in an effort to determine or influence how responsive agency budgets have been to these priority areas. Each Committee

should be prepared to develop a short summary of the assessment area suitable for publishing once the President's FY 1996 budget has been transmitted to the Congress.

A Terms of Reference (TOR) has already been transmitted by OMB and OSTP (June 28) for the environmental and natural resources assessment. For the rest of the assessment areas, this memo should be considered the TOR. In addition, an Arctic research TOR was transmitted from OMB and OSTP to the Interagency Arctic Research Policy Committee to fulfill the Arctic research crosscut requirements mandated in the Arctic Research and Policy Act and current policy.

The recently issued (June 24) TOR for the Information Infrastructure Task Force (IITF) asks that R&D activities relevant to the IITF be provided by the NSTC. Likewise, a July 11, 1994 memo from Bill Galston, Gene Sperling, and John Gibbons asks for R&D relevant to learning and technology. Neither of these non-NSTC reviews will duplicate the NSTC assessments, but will incorporate the results of relevant NSTC assessments into their analysis.

4. Other Priority Areas. All NSTC Committees should continue to further examine and refine the definitions and agency contributions to the remaining list of priorities (according to Committee jurisdiction) cited in the May 6th memo. To the extent possible, agency committee representatives should also provide data to the committees in these priority areas. It is intended that this budget data exchange occur at the program-manager-to-program-manager level. Unlike the assessment areas mentioned above, we are not asking for data that has been cleared by agency budget offices. This information will also be incorporated into the Committee Strategic Implementation Plan. In addition, Committees should be prepared to assist OMB and OSTP in resolving R&D funding issues that arise in these areas during the FY 1996 budget process.

In carrying out these data collection and review activities, please keep in mind the following general provisions:

Participation. Agencies conducting R&D are strongly urged to provide the information required for NSTC Committee assessment in a timely manner. The information will provide OMB, OSTP, and the NSTC Committees with the means for understanding the current agency efforts in the assessment areas, aid in developing an integrated interagency program, identify R&D gaps that need funding and areas of duplication to ensure that maximum benefits are realized from Federal investments.

Data Sharing and Confidentiality. FY 1996 budget information is part of the internal deliberative process of the Executive Branch and is therefore confidential and should not be shared with parties outside the Executive Branch prior to submission of the President's FY 1996 Budget to Congress. This does not mean that agencies cannot

share FY 1996 budget information within the NSTC Committees. Indeed, it is critical that they do. Although agency budget requests are still in the development stage, to meet the NSTC timeframe for submitting NSTC Committee R&D Strategy and Implementation Plans, work needs to start immediately.

Definitions. For the purpose of this activity, research will be defined in accordance with OMB's Circular A-11 R&D definitions.

Data Collection. For the purpose of this activity, there will be no double counting between assessment areas in section 3 and to the extent practicable in section 4.

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.

1 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.

2 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.

3 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 increases 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 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:

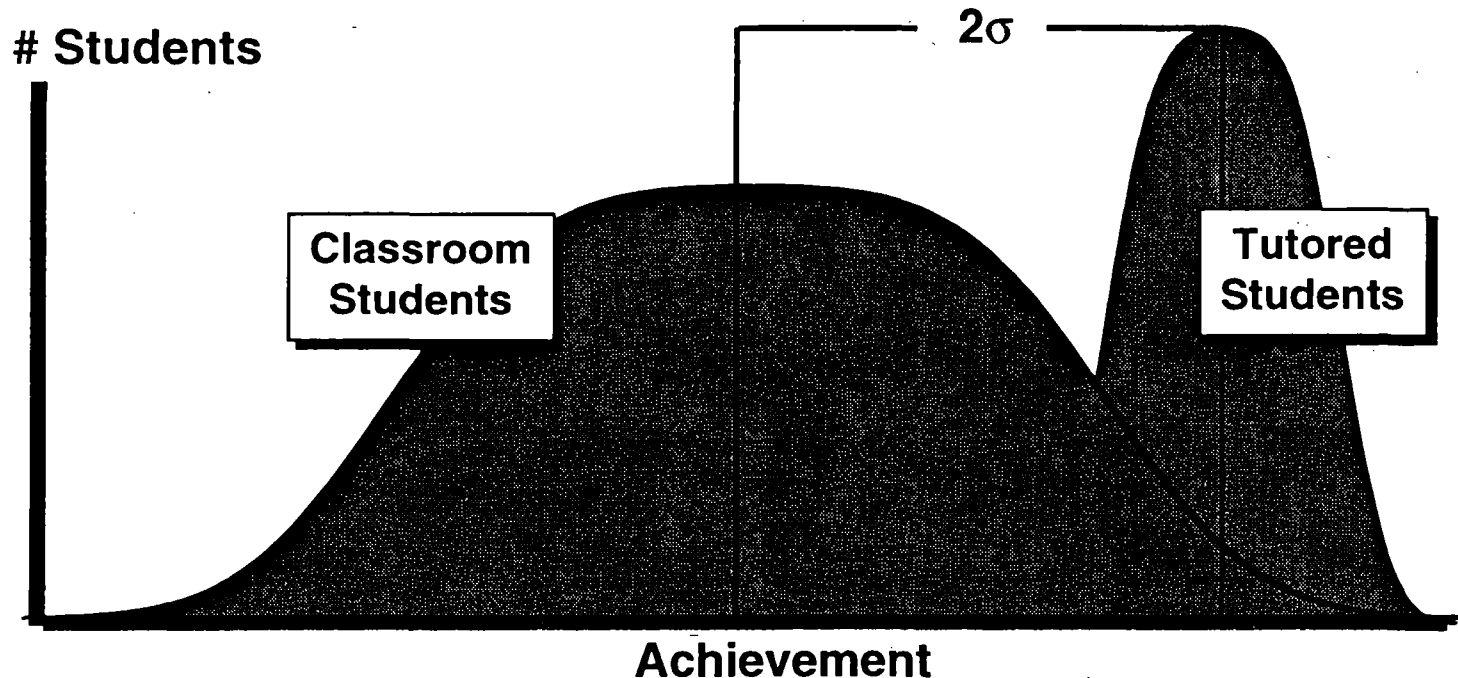
- Children's television programming like Sesame Street and Mr. Rogers Neighborhood has enriched the learning experiences of pre-children for the past 25 years even though the current generation of television watching is basically a passive experience. The new generation of interactive televisions, video-games, 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.

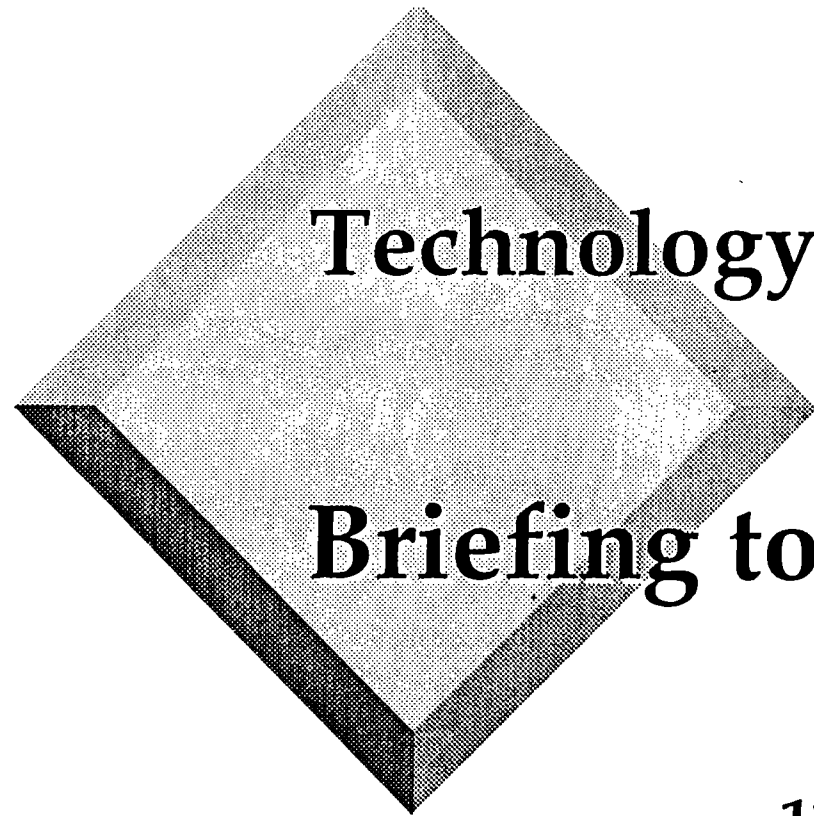
- Businesses of all sizes recognize that adaptability and flexibility are central to corporate survival. This flexibility can only be achieved if their workers -- as individuals and as teams -- are able to keep pace with advanced equipment without expensive off-site training. The kinds of simulated environment 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.

The Learning Revolution's Core: Tutor Learning Through Technology



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



Technology Learning Challenge

Briefing to ETR

11 August 1994

Technology Learning Challenge Vision

To ensure all Americans access
--anytime and anyplace--
to quality education and training
tailored to their individual learning
and workplace needs

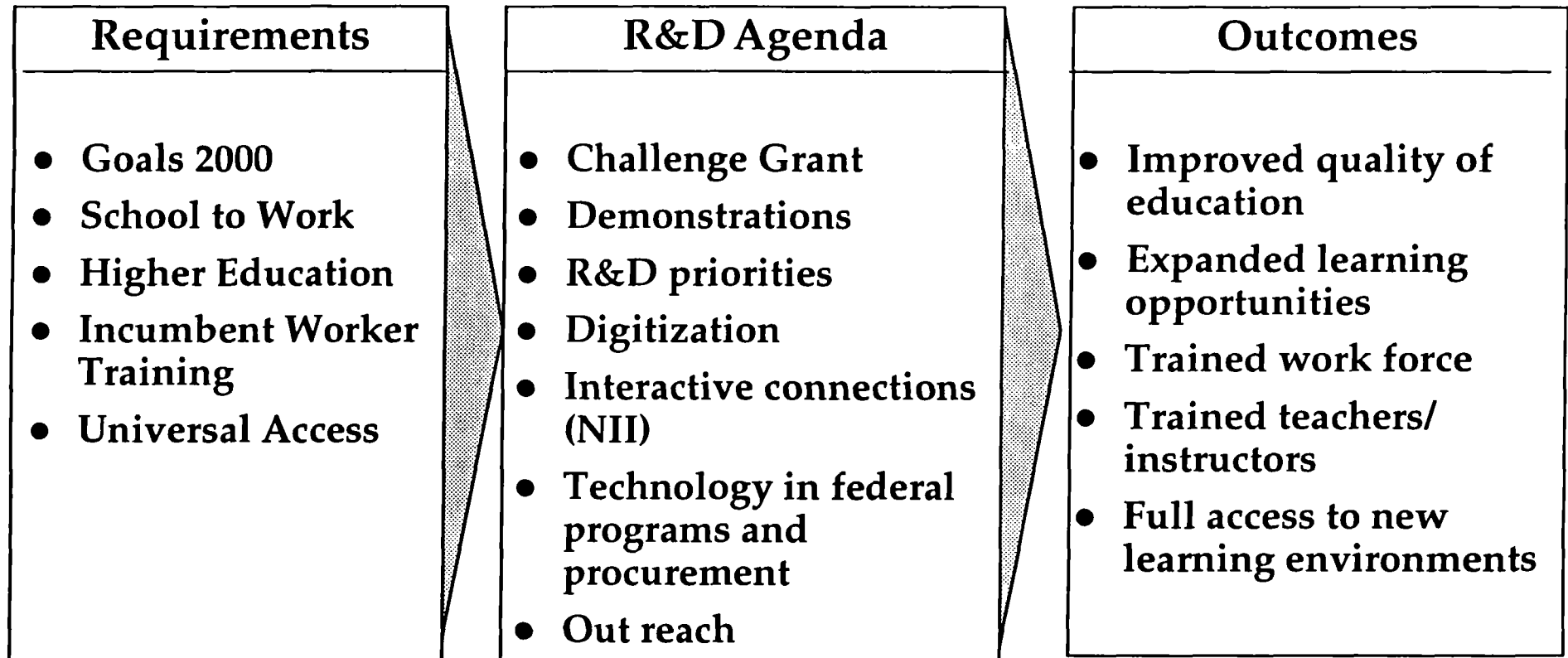
*"The television, the set-top-box, the personal
computer, and the telephone won't exist any more;
their descendants will."*

Fortune Magazine, August 22, 1994

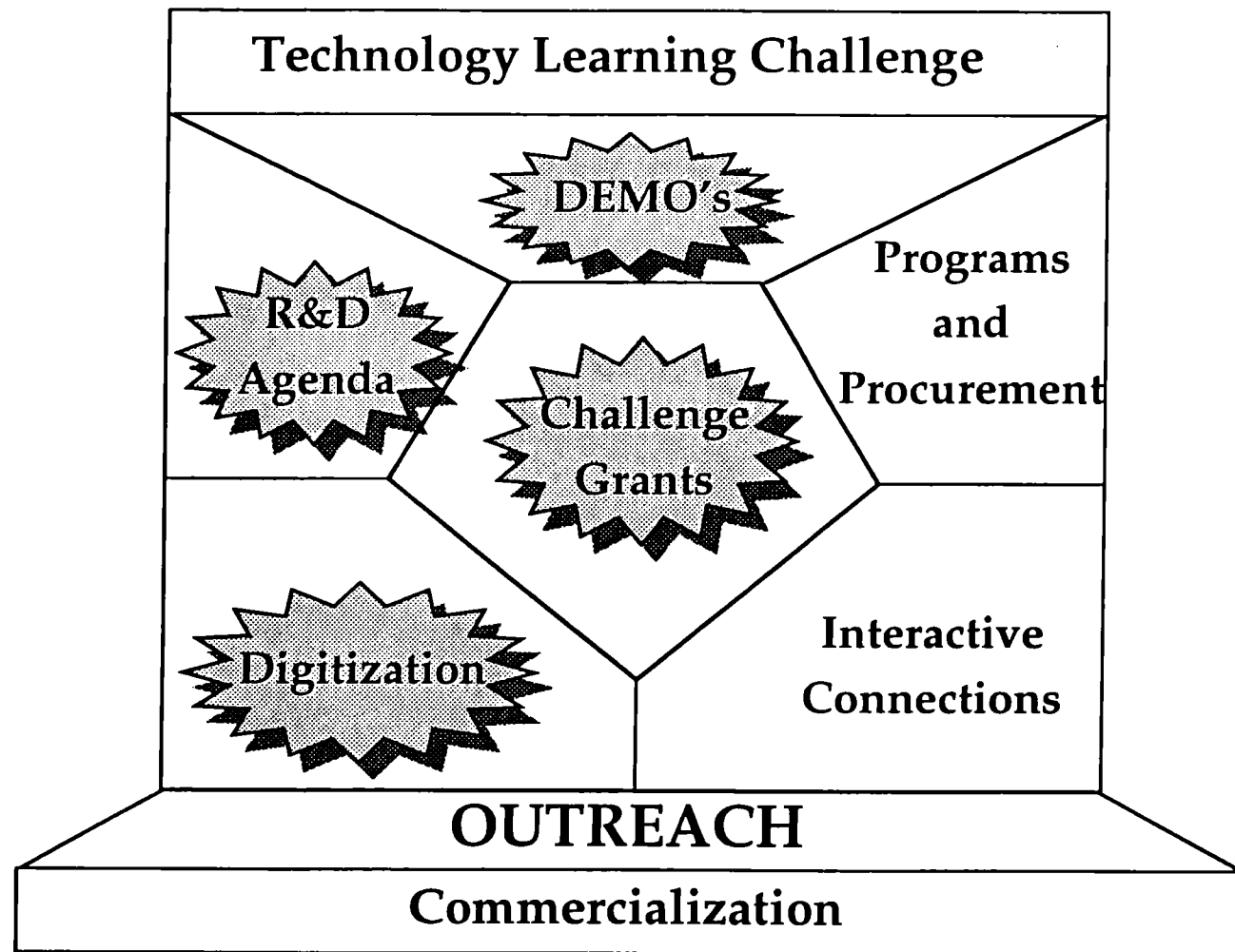
Technology Learning Challenge Goals

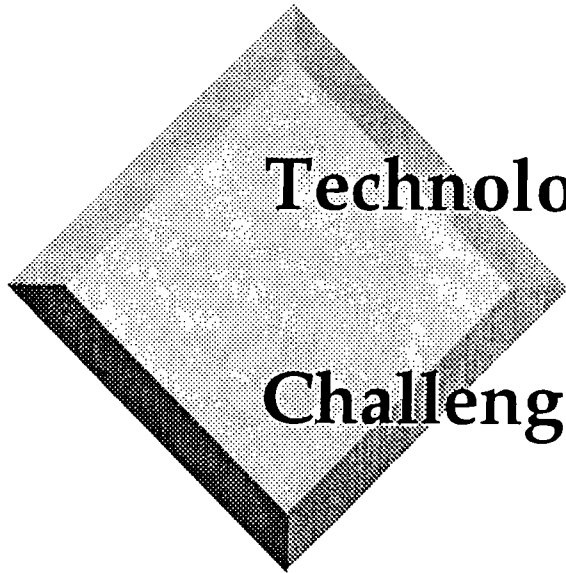
- **Challenge Grant: design, develop and implement new community-based interactive learning environments**
- **Leverage federal research and development to produce scalable demonstrations of advanced learning technologies**
- **Focus and coordinate federal procurement and education and training programs to invigorate learning in schools, workplaces and houses with powerful, interactive learning tools**

Technology Learning Challenge



Task Force on Learning and Technology Components





Technology Learning Challenge

Task 1

Challenge Grant

Challenge Grant Program

Mission:

- To create a nation-wide initiative that will stimulate communities to improve life long learning through the development and use of powerful, interactive learning technologies
- Through a community-based grant program, design and implement creative new uses of technology to advance:
 - ✓ Goals 2000
 - ✓ School to Work
 - ✓ Higher education
 - ✓ Workforce competitiveness 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

Challenge Grant Program (continued)

Proposal elements:

- Challenge complete learning communities to bring together successful technology applications that help schools, businesses, communities and learners at school, at work and at home
- Modeled after successful elements of Empowerment Zone project
- Covers content--not hardware

Types of communities:

- Communities linked geographically
- Virtual communities linked by common interests

Who could propose:

- Complete learning communities
 - ✓ School systems
 - ✓ Colleges and universities
 - ✓ Local businesses
 - ✓ Content experts
 - ✓ Software designers
 - ✓ Telecommunications firms
 - ✓ Others

Challenge Grant Program (continued)

Proposal Criteria:

- Does it offer a creative new strategic vision for using technology to advance life long learning goals: School-to-Work, Goals 2000, higher education, incumbent worker training?
- Is concept applicable to other communities?
- Are there plans to market the concept more widely?
- Is it part of a comprehensive community plan for education and training; will it continue to be supported by the community as an integral part of its instructional programs?
- What is the extent of investment offered by the partners?
- What benchmarks for measuring success?

Cost--How much?:

- 10-15 grants for \$4-6 M/yr for 4 years
- 100 grants for \$500 K/yr for 4 years

Total: \$100 M/yr

Challenge Grant Program (continued)

Interagency coordination funding:

- DoED, DoL, DoD, DoC, DoE, NSF, NEH, NASA, OSTP, OVP, DPC-NEC, OMB, HHS

Federal assistance other than direct challenge grant funding:

- Help set priorities for digitization
- Access to federal resources at labs, NASA and other facilities
- Access to funding for connectivity through DoC/NTIA programs
- Access to NEH program funding by combining application with an NEH application
- Access to state funding for hardware by combining federal and state decision reviews

Management/Funding Options

Option (1) Direct all funding to ARPA in DoD

Pro:

- Comparative ease of adding funding in an agency
- Strong program management abilities
- Proven track record in technology for learning

Con:

- Education not central to DoD mission
- Not consistent with shift to civilian R&D
- Unclear links to ESEA, Goals 2000, School to Work

Management/Funding Options (continued)

Option (2) Direct all funding to DoED

Pro:

- Mission covers most relevant learning communities
- DoED needs an R&D program to support its mission
- Builds on ESEA funding available in FY95

Con:

- Administrative difficulties in getting education programs through appropriations committees
- Little R&D management experience

Management/Funding Options (continued)

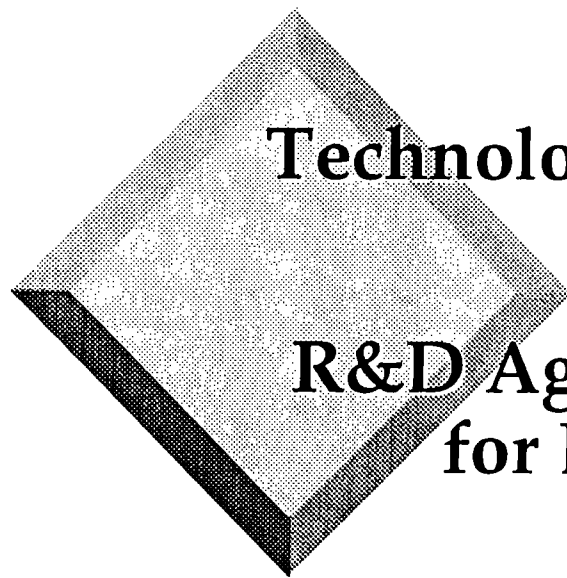
Option (3) Combined programs for children and youth (pre-school through school to work and college) funded through DoED and programs for adults funded through DoD/ARPA

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



Technology Learning Challenge

Task 2 & 3

R&D Agenda and Demonstrations for Education and Training Technology

Technology Learning Challenge

R&D Agenda Focus Areas

- Undertake basic research on learning and cognitive processes
- Develop new models to evaluate learning productivity
- Develop high-quality, affordable learning tools
- Demonstrate innovative technology and networking applications

Technology Learning Challenge

R&D Agenda Focus Areas (continued)

Background:

- Rivlin/Gibbons memo (Aug 5) states that the IITF and ETR reviews will incorporate relevant NSTC assessments in their analyses
- While much work is being done in some of the agencies (i.e., DoD, NASA, DoE), insufficient R&D is focused on interactive learning technologies
- CET and agencies have major responsibility to:
 - ✓ Promote technology transfer to DoL, DoED, DoC and others
 - ✓ Coordinate, supplement and focus community R&D efforts

Recommendations:

- CET should provide the management resources to craft a detailed R&D plan
- CET should define a set of ambitious interactive demonstration projects that can become the focus of interagency collaboration

Demonstration Features

Attributes:

- Scalable
- Sustainable
- Adaptable
- Distributed
- Accessible and ubiquitous
- Commercializable

Management/participation :

- Public/private supported
- Fully funded
- Supported by interagency collaboration

Menu of Demonstrations to Choose From

Administration Program

Goals 2000
School to Work
Incumbent Worker
Training
Re-employment Act
NII Goals
Military Readiness

Target Population

Pre-school
K-8
8-12
School to Work
Higher Education
Incumbent Worker
Training
Disadvantaged/Disabled
Military Personnel

Discipline

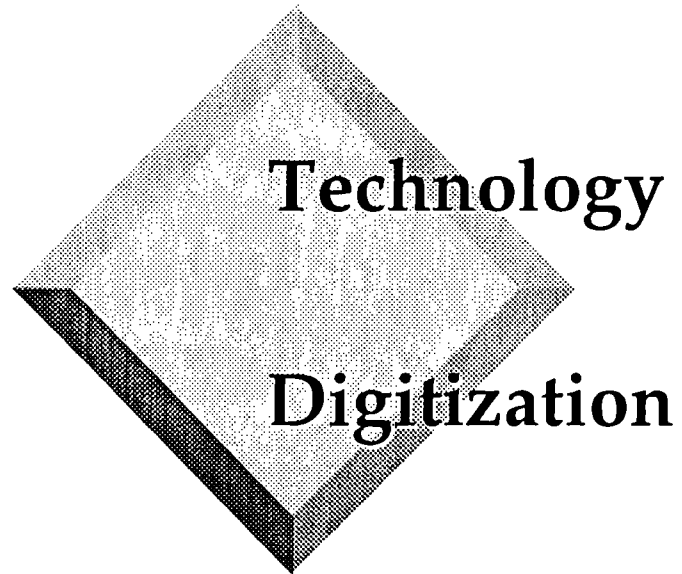
Math
Physical Sciences
Social Sciences
Arts & Humanities
Trades
Business
Behavioral Sciences

Technology Basket

Integrated Courseware
Distance Learning
Re-engineering School
Team Training
Just-in-time Learning
Synthetic Environments

Candidate Demonstrations

Target Groups	Goal	Key Features	Lead Agencies
Pre-School	All students start school ready to learn	An evaluation of the effectiveness of "edutainment" software to teach fundamental skills	DoED
Grades K-8	All student leave grades 4 and 8 having demonstrated competency over challenging subject matter	A cost-effectiveness assessment of interactive courseware and distance learning to improve core skills	DoED
Grades 8-12	Every school in America will ensure that all students learn to use their minds well so they may be prepared for responsible citizenship	A study of the ability of interactive multimedia and synthetic environments to enhance learning across knowledge domains and reform traditional education	DoED
Vocational Ed	All U.S. high school graduates obtain meaningful employment	An evaluation of the benefits of using interactive courseware and distance learning to improve job entry skills	DoED/ DoL
Higher Education	All graduates are equipped for success in the 21st century	A cost-benefit study of the use of models and simulation to advance the quality of higher education and research	DoED
Incumbent Workers	All workers acquire new skills needed in the 21st century	A cost-benefit study of the use of distance learning and just-in-time training technologies	DoL/ DoD
Military Personnel	The U.S. military is the best equipped, trained, and led fighting force in the world	An evaluation of the capabilities and limitations of advanced simulation and distance training to transform the traditional training infrastructure	DoD



Technology Learning Challenge

Task 4

Digitization

Digitization

Task:

- Define options to make federal assets available in digital form and at the lowest possible cost

Status: A systems perspective was adopted to structure the task

- Research & development
- Building collections
- Dissemination
- Grants

For each area

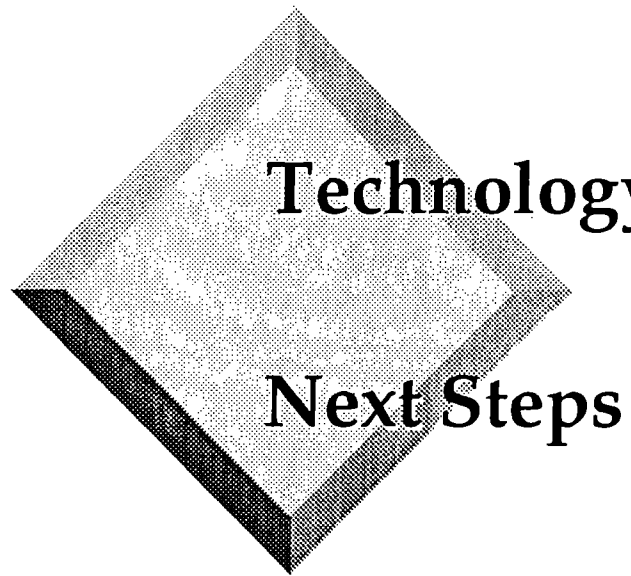
- Current status was established
- A preliminary assessment was made of key needs

Efforts are underway to refine

- Characterization of status
- Key needs

Recommendations

- Redirect Library Services and Construction Act funding to digitization
- Support FY96 funding requests for NEH and Smithsonian
- Provide \$4 million in FY96 to fund digitization of cultural resources for SI, NARA, LoC consortium



Technology Learning Challenge

Next Steps

Technology Learning Challenge

Next Steps

Date	Task	Instrument	Responsibility
18 Aug	- Decision memo to ETR principals on Challenge Grant - R&D agenda and demonstrations recommendation to CET - Digitization recommendations to CET	- Decision memo - White paper - White paper	- ETR (Schmidt) - R&D Subcommittee (Robinson/Finch) - Task Force (Lytel)
9 Sept	Agency budget submissions to OMB	Standard format	Agencies
29 Sept	FY96 priorities on R&D agenda and demonstrations to NSTC	Strategic plan (5-10 page summary)	CET (Kunin/Glynn)
4 Nov	- Federal programs and procurement plans - Formulate Outreach program	- Planning package - Action plan	- Task Force (Portman/Schmidt) - Task Force (Kohlenberger)
TBD	Interactive connections	Planning package	NII Task Force (Sallett/Kalil)
TBD	Public announcements and roll-out	Communication, event, roll-out	OVP with designated agencies

**THE INTEGRATION OF LEARNING TECHNOLOGIES INTO
MAJOR FEDERAL EDUCATION AND TRAINING PROGRAMS**

**An Action Plan of the White House Learning Challenge
by the Federal Programs Working Group**

DRAFT FOR REVIEW AND CLEARANCE

2 December 1994

Forward

This report is the product of the Federal Programs Working Group (FPWG). The FPWG is one of seven interagency groups charged by the White House Education, Training, and Re-employment Working Group to achieve two principal objectives. The first is to advance the missions of major Federal programs through the use of learning technologies. The second is to advance the Administration's priority of integrating effective uses of technology into the Nation's education and training system. Details on the FPWG are contained in Appendix A.

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I. INTRODUCTION

While communication and information technologies have transformed private industry, the entertainment business, and other business sectors, they have yet to have a significant impact on the education and training sectors. Technology-based instructional materials, such as computer-based instruction and simulations, can contribute to, and fundamentally improve the lifelong learning process.

The purpose of this report is to recommend a comprehensive action plan that the Federal government can undertake to integrate technology more fully into its education and training programs. This report is organized in two sections. The first section presents a summary of the key Federal legislative acts that provide a framework for coordinating Federal activities, and then provides summaries of key federal employment and training programs. The second section presents seven recommendations designed to bring the Federal education and training system up to par with the private sector's implementation of learning technologies.

II. CURRENT FEDERAL EFFORTS

The Federal government sponsors numerous education and training programs each with different target populations, e.g., in-school youth or dislocated workers. This section briefly summarizes the major Federal framework programs that represent the Administration's effort for lifelong learning and then describes several major Federal programs that deliver education and training services. Slightly more detailed discussion of each of these can be found in Appendix B.

Framework Programs

Several Federal programs establish a framework for Federal efforts to address education and training needs. These legislative acts represent the trend toward focusing on the need for introducing learning technologies into Federal program delivery.

Goals 2000: Educate America Act

This Act is the Administration's framework for education reform. It provides resources to states and communities to develop and implement comprehensive education reforms aimed at helping all students reach high academic and occupational skill standards by: (1) establishing eight national education goals; (2) providing leadership for national educational reform; (3) providing support for state and local content standards and assessment standards used to measure educational progress; (4) supporting parental involvement in education; (5) encouraging the formation of the national Education Standards Improvement Council; (6) promoting the formation of the National Skill Standards Board; and (7) creating an office of educational technology within the Department of Education.

School-To-Work Opportunities Act

This Act creates opportunities for school-to-work systems through the country for all youth through seed capital grants to states and local partnerships coupled with technical assistance. These systems must: (1) be part of comprehensive school reform; (2) integrate Goals 2000 and further national education goals; (3) integrate academic and occupational training; (4) integrate school-based and work-based learning; and (5) provide performance-based opportunities for all students.

Technology-Related Assistance Act for Individuals with Disabilities

The goal of this program is to bring about fundamental systems change in the availability of assistive technology for Americans with disabilities. This is achieved through development of model programs for the delivery of assistive technology to individuals with disabilities and advocacy conducted in a consumer responsive manner. Policies and practices that impede the acquisition of necessary devices are vigorously challenged. The program provides funding to projects in 55 U.S. States and Territories to benefit K-12 students through learning-related activities.

Delivery Programs

The following nine programs provide much of the Federal support for the delivery of educational and training services.

Head Start

The purpose of Head Start is to provide services to economically disadvantaged preschool-aged children and their families to help prepare for life and for school. This program also provides health and nutrition services, social services and parent involvement services. Some programs even receive special funding for employment, literacy and substance abuse services for parents.

Compensatory Education (Chapter 1/Title I)

This program provides funding to local education agencies to improve the educational opportunities of educationally deprived children in high poverty schools by helping those children to succeed in the regular classroom, attain grade-level proficiency, and improve achievements in basic and more advanced skills. It also provides financial assistance to local educational agencies to meet the special educational needs of educationally deprived children at the preschool, elementary, and secondary schools levels.

Eisenhower Professional Development Program

This program is designed to improve the skills of mathematics and science teachers in the Nation's public and private elementary and secondary schools. It provides funding to the States to support activities implemented by State educational agencies, local educational agencies, State agencies for higher education, and institutions of higher education.

Job Corps

This national training and employment program administered by the Department of Labor addresses the multiple barriers to employment faced by disadvantaged youth throughout the United States. Its residential aspect distinguishes Job Corps from other employment and training programs, and enables it to provide a comprehensive array of services in one setting 24 hours per day, seven days per week.

Adult Basic Education and Literacy Programs

This program provides educational opportunities for adults over the age of 16, not currently enrolled in school, who lack a high school diploma or the basic skills to function effectively in the workplace and in their daily lives. Supported instructional courses include Adult Basic Education, Adult Secondary Education, and English As A Second Language.

Job Training Partnership Act (JTPA)

The JTPA program provides job-training services for economically disadvantaged adults and youth, dislocated workers, and others who face significant employment barriers. Its purpose is to move jobless individuals into permanent, self-sustaining employment. A distinguishing aspect of the program is the coordination that takes place among state and local governments and the business community to produce partnerships that combine effective program administration with knowledge of the private-sector job market.

Perkins Vocational and Applied Technology Act

The overall purpose of this Act is to make the United States more competitive in the world economy by more fully developing the academic and occupational skills of all sectors of the population. This goal will be achieved through concentrating resources on improving educational programs leading to academic and occupational skill competencies needed to work in a technologically advanced society.

One-Stop Career Center System (OS)

The OS system helps integrate the delivery of career transition information and services into a re-employment system along several paths: (1) implementation grants to states to create statewide systems; (2) planning and development grants to states for the same purpose; (3) grants to local systems to serve as learning laboratories; (4) grants to states to improve the quality of their labor market information systems; and (5) research, development, and operations consortia of states to support the labor market initiatives.

Rehabilitation Act (Title I)

The goal of the Vocational Rehabilitation (VR) Services Program (approximately \$1.8 billion) is to meet the "needs of individuals with disabilities so that such individuals may prepare for and engage in gainful employment to the extent of their capabilities." Rehabilitation training grants are awarded to ensure that skilled workers are available to provide the broad scope of services required by clients of the State-Federal programs of vocational rehabilitation, supported employment and independent living. A justification is required for allocation of training funds based on findings of personnel shortages contained in an annual report to Congress.

TABLE 1. Federal Framework Programs Targeted for the Expanded Use of Learning Technologies

PROGRAM	GOALS 2000	SCHOOL-TO-WORK	TECHNOLOGY-RELATED ASSISTANCE ACT
Overall Purpose	Provides framework for educational reform	Create school-to-work systems for all youth in all areas of the country	Systems change in availability of assistive technology
Lead Agency	Department of Education	Departments of Education and Labor	Department of Education
Planned Expenditures	\$400 million for FY '95	\$250 million for FY '95	\$41 million
Target Population(s)	All K-12 academic and vocational students	All youth seeking to enter the workforce	All persons with disabilities
Current and/or Potential Uses of Technology Supported by Program	To be identified by local grant recipients	To be decided by local grant recipients	To provide access and independence
Related Technology-Based Activities Supported		To be decided by local grant recipients	Technology Demonstration Centers in 55 states and territories
Method of Distribution	Title III technology grants	Competitive grants to states and communities	Competitive grants

TABLE 2. Federal Delivery Programs Targeted for Expanded Use of Learning Technologies

PROGRAM	HEAD START	COMPENSATORY EDUCATION (CHAPTER 1/ TITLE I)	EISENHOWER PROFESSIONAL DEVELOPMENT PROGRAM	JOB CORPS	ADULT BASIC EDUCATION AND LITERACY	JOB TRAINING PARTNERSHIP ACT (JTPA)	PERKINS VOCATIONAL AND APPLIED TECHNOLOGY ACT	ONE-STOP CAREER CENTER SYSTEM	REHABILITATION ACT
Overall Purpose	Help prepare pre-school children and their parents for school and life	Improve educational opportunities in high poverty schools	Promote teaching of mathematics and science	Improve employability of disadvantaged youth	Help educate adults over age 16 not enrolled in school	Provide youth and adults with job readiness skills	Promote improved academic and occupational skills	Help integrate career transition information and services into a "re-employment system"	Prepare persons with disabilities for employment
Lead Agency	Health and Human Services	Department of Education	Department of Education	Department of Labor	Department of Education	Department of Labor	Department of Education	Department of Labor	Department of Education
Planned Expenditures	\$3.3 billion in FY '94	\$6.7 billion for FY '95	\$320 million for FY '95	\$2.9 million for ADP	\$254.6 million	\$965 million for FY '95	\$956 million for FY '95	\$90 million for FY '95	\$1.8 billion (all programs)
Target Population(s)	Economically disadvantaged pre-school children and their parents	Educationally deprived children, teachers, and administrators	Teachers of mathematics and science, administrators	Disadvantaged youth seeking to enter the workforce	Educationally deprived adults	At-risk youth, economically disadvantaged and dislocated adults	Students of vocational arts	All job seekers (especially those seeking re-employment), and all employers	Persons with disabilities at or near work age
Current and/or Potential Uses of Technology Supported by Program	Interactive satellite distance learning program, national electronic bulletin board system	Computer laboratories in schools	Networking to promote sharing of instructional materials, instructional videodiscs and software	Computer Managed Instruction (CMI) system supporting record keeping, diagnosis, assignment, testing and tracking	Interactive teleconferencing, dial-in electronic communications	ETA Wide Area Network (WAN) which includes access to Bulletin Boards, E-mail, TTTC, and Internet	Purchase of computers, software, curricula for learning labs	To be identified by local grant recipients	Monitoring Information System, MONLOG, computerized tracking, used to target resources for training
Related Technology-Based Activities Supported	Incorporate satellite distance learning as part of training and technical assistance	Technical Assistance Centers, Rural Technical Assistance Centers	Forums for promoting technology	NA	Software development	Satellite transmissions for delivering training to regional offices	Technical assistance to state and local administrators	Technology-based proposals from grant applicants encouraged	Client Assistance Program Research (CAPAR)
Planned Expansion of Automated Tools	Using television and visual media as educational tools	Connection of stand-alone systems to networks		Job Corps ADP System, educational software packages usable with LANs	Linking electronic networks	Expanded use of Internet for information dissemination	Distance learning tools, simulation software, intelligent tutoring systems	Expanded use of Training Technology Resource Center (TTTC)	Internet access
Method of Distribution	Grants to communities	Formula grants to districts	Formula grants to states	Operations of 100+ residential centers	Formula grants to states	Formula grants to states	Formula grants to the states	Competitive grants	Formula grants to the states

III. RECOMMENDATIONS FOR INTEGRATING TECHNOLOGY MORE EFFECTIVELY INTO EDUCATION AND TRAINING

1. Increase both the supply of high-quality learning tools and demand for these products in the education and training sectors.

Federal agencies should encourage developers to produce applications that meet high standards of educational quality, and should also find ways to promote demand at the local and state level. Federal program offices can accomplish these goals by bringing federal and state policy makers, local education providers, software developers, and content experts together to discuss common concerns, and by working with local education and training providers to find ways to aggregate demand for high-quality products.

Action Steps

- Goals 2000 promotes the use of state and voluntary national standards to enlarge markets for high-quality curriculum products.
- The School-to-Work program encourage the use of learning technologies in state and local solicitations and grant awards.
- Chapter 1/Title I proposes a technology forum focusing on: guidelines and resources for technology acquisition, content standards, professional development, and consolidated technology purchasing.
- Eisenhower proposes using conferences as a forum for focusing on tools that help teachers, including authoring tools, administrative aids, and multimedia professional development tools.
- The Adult Education Literacy Program sponsored a software developers' conference, October 18-19, 1994. Planned is a follow-up workshop along with dissemination of information about quality software
- One-Stop is planning a technology fair with exhibits and "concurrent workshop tracks"
- Perkins has forums focusing on school-to-work software.

2. Consolidate federal technology dissemination, technical expertise, and promotion

Federal programs typically have little capacity to address technology issues, yet all education and training programs face similar challenges and could benefit from a single source of advice, training, and assistance. The newly-created Interagency Technology Office (ITO--created by the Department of Education) might take on this role with the addition of 3-5 staff members loaned from federal agencies. This office should be charged with the following:

- Marketing learning technologies information across Federal agencies that have education and training responsibilities;
- Developing methods for adapting and transferring educational technologies developed in one environment (e.g., National Security) to other educational environments (e.g., Job Corps) where there is the reasonable expectation of benefit;
- Disseminating effective learning technologies information on educational technologies throughout the Nation's education and training system;
- Maintaining a continuously-updated inventory of educational technologies being sponsored by Federal agencies; and
- Serving as a clearinghouse for disseminating Federal agencies' experiences with learning technologies.

Action Steps

- Both the School-to-Work and One-Stop Programs propose using ITO to provide expertise and assistance to program offices.
- Job Corps views ITO as a provider of assistance and advice to program operations.
- ITO can support Perkins by providing assistance on school-to-work applications

3. Plan for technical assistance coordination through the technical assistance provisions of the Improving America's Schools Act (IASA)

The recently enacted IASA (the reauthorization of the Elementary and Secondary Education Act) contains provisions mandating the provision of coordinated support across Education Department programs through a system of 15 assistance centers. The Act also calls for the provision of assistance and professional development for the use of technology in education through a set of regional consortia. These new entities, some of which will be operational late in 1995, should provide assistance across as many education and training programs as possible, including Chapter 1/Title I, Eisenhower, JTPA, Perkins, Head Start, and others.

4. Provide support and training to implementors and managers of federal and local programs

Federal agencies should actively develop expertise in technology applications among the managers and implementors of these programs at all levels - federal, state, and local. Familiarity with emerging technology applications will strengthen planning processes and lead to more productive use of future resources.

Action Steps

- Goals 2000 provides grants to states for the development of state education improvement plans.
- Chapter 1/Title I proposes to develop a training plan for Federal staff and deliver training to these people in technology-related areas.
- Eisenhower recommends continuous training to program staff and encourage conferences and other activities.
- Job Corps proposes to provide training to staff.

5. Where appropriate, expand the use of telecommunications technologies, including electronic networks, video conferencing, and distance learning, to support both learning activities and program operations

The use of these technologies has transformed the American workplace. These tools should become commonplace in the education and training sectors as well.

Action Steps

- Chapter 1/Title I can use the Internet to identify educational technology applications and proposes to develop and install technology packages on Internet.
- Job Corps has identified specific learning technologies to greatly enhance the classroom component of the program.
- One-Stop: promote technology usage in state and local solicitations
- Adult Basic Education has already sponsored several interactive teleconferences on learning technologies and still others are scheduled for 1995. Electronic communications efforts are underway to develop and implement an electronic state management information system to State and Federal staff to transmit reports.
- Head Start currently uses satellite distance learning for certification of staff.

6. Develop a Federal Research Agenda

The Federal government should develop a research agenda encompassing all relevant agencies. This unified agenda should identify research issues of interest to all relevant Federal agencies, and should define ways in which research can be conducted with a minimum of overlap among agencies. This agenda should define:

- On-going research needs related to Federal target populations;

- Promising educational tools and practices that involve technology;
- The educational and training products that meet the needs of various Federal target populations; and
- Methods for sharing relevant information, teaching tools and techniques, etc. using electronic networks and teleconferencing.

Action Steps

- Chapter I/Title I will request the Planning and Evaluation Service to conduct studies and prepare ideabooks which assess the effectiveness of technology for LEA use, identify barriers to the SEA's and LEA's effective use of technology and identify strategies for encouraging the effective use of technology in the classroom.
- The Adult Education and Literacy program is empowered to conduct basic and applied research and demonstrations related to the technology.

7. Strengthen the Department of Education's Office of Educational Technology

The federal government should make the Office of Educational Technology the central organizational focus for educational technology leadership, policy coordination, and promotion. This office should be charged with carrying out the following functions:

- Promoting quality in education and training applications;
- Disseminating valuable information to the field;
- Coordinating policy among agencies with relevant programmatic activity; and
- Promoting the use of the National Information Infrastructure (NII) to serve the nation's education and training systems.

APPENDIX A THE FEDERAL PROGRAMS WORKING GROUP

The Federal Programs Working Group (FPWG) is one of seven working groups that comprise the White House Technology and Learning Challenge. FPWG has been charged by the White House Education, Training, and Re-employment Working Group to achieve two broad objectives. The first is to advance the missions of major Federal programs through the integration of technology. The second is to advance the Administration's priority of integrating effective learning technologies into the Nation's education and training system.

Members of the FPWG have been drawn from the Office of the Vice President, the White House Office of Science and Technology Policy, the White House Domestic Policy Council, the Department of Education, the Department of Health and Human Services, and the Department of Labor. Individual representatives are listed below:

Office of the Vice President

Suzanne Ramos

White House Office of Science and Technology Policy

Henry Kelly

White House Domestic Policy Council

Mike Schmidt

Department of Education

Norris Dickard

Guy Hammer

Johathan Hoyt

Talmira Hill

Christine Jackson

Herb Jacobson

Mary Moran

Department of Health and Human Services

Jim Kolb

Department of Labor

John Chowning

Judith Gilbert

Rob Portman

Brian Shea

Jim Vollman

APPENDIX B RELEVANT FEDERAL EDUCATION PROGRAMS

This section begins with a summary for selected Federal training and education programs that use or have the potential to use technology-based learning technologies. Each program is summarized under three broad sections; namely:

- Program overview
- The role of technology
- Implementation plan

Programs described in this appendix are divided into two groups. The first contains the following framework programs:

- 2000: Educate America Act
- School-To-Work Opportunities Act
- Technology-Related Assistance Act for Individuals with Disabilities

The second group contains the following delivery programs:

- Head Start
- Compensatory Education (Chapter 1/Title I)
- Eisenhower Professional Development
- Job Corps
- Adult Basic Education Act
- Job Training Partnership Act (JTPA)
- Perkins Vocational and Applied Technology Act
- One-Stop Career Center System
- Rehabilitation Act (Title I)

GOALS 2000: EDUCATE AMERICA

Purpose of the Program

The Goals 2000: Educate America Act is the administration's framework for education reform. It is designed to provide resources to states and communities to develop and implement comprehensive education reforms aimed at helping all students reach high academic and occupational skill standards. Specifically, it targets K-12 academic and vocational students. Key provisions include the statutory establishment of eight national education goals, national education reform leadership, support for state and local content standards and assessment standards used to measure educational progress, support for parental involvement in education, and the formation of the National Education Standards Improvement Council (NESIC) and the National Skill Standards Board. The legislation also creates an office of educational technology within the Department of Education with responsibility for providing national leadership in using technology to improve learning.

The Role of Technology

Statutory Provisions

Title II of Goals 2000 creates an office of educational technology within the Department of Education. This office is charged with providing national leadership and with the development of a long-range plan for technology in education.

Title III of Goals 2000 provides grants to states in FY 1994 to develop comprehensive education improvement plans. A minimum of \$75,000 is set aside for each state to ensure that the use of technology is integrated into this plan. Section 317 of the act defines the requirements of this technology component in detail. Once a state or territory's improvement plan has been approved by the Secretary, a state is eligible for more substantial grants for implementation. It is expected that in many states, a portion of federal implementation funding will support technology infrastructure and other technology components.

Title III also requires states that receive technology planning funds to establish a technology panel with broad-based representation.

Technologies relevant to Goals 2000 include computer hardware, electronic networks (especially local area networks in schools and connections to the Internet for instructors and students), instructional software and other applications, distance learning programs, expanded use of telecommunications equipment such as modems and voicemail systems, video and video production equipment, and the development of digital libraries and file servers that provide distributed access to school and community information.

Implementation Plan

FY 1994 Planning Grants and FY 1995 Implementation Grants

- The Office of Educational Technology in the Department reviews each application for technology planning funds, and if necessary provides comments on the state's proposal. Over 30 state applications have already been reviewed.
- The Office of Educational Technology is providing assistance to states in developing the technology component of their Goals 2000 state improvement plans. A conference bringing state network directors, telecommunications regulators, and private sector representatives was held on September 23-25 in Austin, TX. Another conference is planned for March, 1995. In addition, a state technology planning guide will be distributed in late October. Assistance to individual states is being provided upon request.
- The states' education improvement plans will be submitted to the Department in spring, 1995. If approved, significant implementation funding will be available. The Office of Educational Technology will participate in the development of criteria for evaluating these state plans.

Content and Assessment Standards

- The Office of Educational Technology will encourage national, state, and local standards development projects to integrate technology into these model standards.

SCHOOL-TO-WORK OPPORTUNITIES

Purpose of the Program

The School-to-Work Opportunities Act (STW) creates school-to-work opportunities systems throughout the country for all youth, both in school and dropouts. This is accomplished through seed capital grants to states and local partnerships coupled with technical assistance.

Such systems must: (1) be part of comprehensive school reform, (2) integrate Goals 2000 and further national education goals, (3) integrate academic and occupational training, (4) integrate school-based and work-based learning, and (5) provide performance-based opportunities for all students.

STW helps youth acquire knowledge, skills, abilities, and labor market information needed to make a smooth and effective transition from school to career-oriented work and to further education and training. In doing so, it requires that every school-to-work system contain three core elements: (1) school-based Learning (2) work-based Learning, and (3) Connecting Activities.

Role of Technology in the Program

Being conversant with technology is a necessary precondition to developing high skills, which in turn, leads to high wages. Technology can link schoolroom and workplace geographically; subject matter content. It can provide innovative, self-paced curriculum/instruction as well as creative and valid means for measuring performance against industry skills standards. Students can be assisted in working with labor market information in order to identify possible career choices by the 11th grade. The availability and distribution of work-based learning opportunities, industry mentors, and other connecting activities as defined by the Act can be managed by technology.

The most relevant technology applications for the STW program would be networking capabilities, including an MIS system for management and performance evaluation and real time labor market information, and self-paced content modules for students. Many of the newest technology applications that are useful in other disciplines can also impact School-to-Work programs. For example:

- Personal Computers: Vocational-technical students need these to retrieve data, communicate, and learn key programs used at home or in the workplace (word processing, spreadsheets, databases, and design).
- Electronic mail: Provides access to research databases and special periodicals as well as the possibility of working on projects with students across the world.
- Interactive videodiscs: Can store and retrieve massive amounts of information in the form of video, sound, and text providing high quality lessons in diverse occupational areas.

- Intelligent Tutoring Systems: Students can get unlimited practice on a variety of topics, from a medical technique to brake repair, and can move ahead to more complex materials when prepared. This tool is also useful as an assessment technique.
- Simulation Software: Design students through the use of software such as AutoCAD can create a drawing without ever touching a pencil. DOD has been a leader in the development of such software with applications in everything from construction technology to jet engine repair. The spinoff possibilities are legion.
- Distance Learning Tools: Increases the possibility of equal access to a quality education for all students, especially in rural areas where resources are limited for certain programs.

Implementation Plan

- Promote, encourage, and "incent" the use of learning technology in subsequent State and local solicitations for grant awards. (Eight states, 15 localities, and approx. 15-20 urban/rural high poverty areas are already in the process of receiving implementation grants, with more to be solicited and awarded in FY 95 and beyond.)
- Focus technical assistance and research more heavily on the application of learning technologies. One mechanism would be for someone with experience and expertise in technology from other federal program (e.g., Defense, Energy, Commerce's NIST program) or a loaned Executive to join the School-to-Work implementation team.
- Fund and operate pilot demonstrations (focusing primarily on technology application) through an increase in "National Activities" funds.
- Innovative use/application of technology is encouraged in state and local school-to-work partnerships. It is an allowable cost under the published Solicitations for Grant Award. Technical assistance funds earmarked under the Act's "National Activities" should be used to explore the use of learning technology or dedicated towards research and evaluation. The programs's Governing Board should adopt a technology emphasis for these funds in FY 1996 and beyond.

Draft

**TECHNOLOGY RELATED ASSISTANCE ACT
FOR INDIVIDUALS WITH DISABILITIES**

(Information not yet received)

HEAD START

Purpose of the Program

Head Start provides services to economically disadvantaged pre-school aged children and their families to help prepare for life and for school. The program currently serves about 720,000 children. In addition to a developmentally appropriate curriculum for the education component, the program provides health and nutrition services, social services, and parent involvement services. Some programs receive special funding to provide employment, literacy and substance abuse prevention services to parents.

Head Start is a community-based program sponsored by about 1400 grantees and 600 sub-grantees (who may be public or private non-profit agencies). Head Start targets economically disadvantaged pre-school children and their parents. Classroom teachers, teacher assistants, and parent classroom volunteers are also target audiences. Funding (\$3.3 billion in FY 1994) is provided directly from Federal Regional offices to the grantees without State involvement.

The funding guidance issued to Head Start grantees permits the use of base grant funds, discretionary grant funds, and quality improvement funds for the purchase of program (and management) hardware, software, as well as to support staff training through satellite distance learning approaches.

Role of Technology

Learning technologies are being used as a teaching device in the classroom. A number of programs have used computers in the classroom, including participation in a demonstration project funded in part by hardware contributions by IBM.

An interactive satellite distance learning program for Head Start staff and parent volunteers in remote areas has been successfully developed and implemented in 39 states, 22 Indian Reservations, Alaskan villages, the Pacific Territories, Puerto Rico, and the Virgin Islands. The program now in its fourth year of funding has proven very effective in providing the training needed to achieve the Child Development Associate (CDA) credential in rural areas, and earn college credits applicable to degree programs.

A national electronic bulletin board system (BBS) is currently in use as a resource for developing technology demonstration programs and then disseminating results.

Head Start uses learning technologies to advance educational opportunities for parents. Grantees are currently using a variety of applications in teaching literacy, providing job skills development training, GED preparation, and parenting skills.

Head Start funds three demonstration programs to explore the use of assistive technology to meet the needs of children with disabilities. It announces the availability of demonstration Federal funds in the Federal Register and awards them on a competitive basis. Results are disseminated

through publications, and through the network of training and technical assistance contractors, through national meetings such as the annual training conference of the National Head Start Association, and other means.

Implementation Plan

During the remainder of this fiscal year and next, Head Start expects to promote the use of technology in the following ways:

- To institutionalize the satellite distance learning project for training classroom staff and parent volunteers.

This project has already demonstrated the effectiveness of satellite distance learning in providing needed high quality training to Head Start teaching staff in remote, geographically isolated areas.

If the project becomes self sufficient based upon direct payment for the training by grantees (out of training and technical assistance funds in their base grants), the Head Start Bureau expects to pilot the use of this kind of technology for other priority training needs within Head Start programs across the country.

- To incorporate satellite distance learning as part of the Head Start training and technical assistance (t/ta) system. The current Head Start t/ta is being reviewed to determine what changes need to be made in its capacity and structure in order to better support grantees. It is expected that satellite distance learning will be an integral part of the new system.
- To train Head Start staff in a significant number of programs to assist parents in using television and other visual media as an educational tool as a part of their children's preschool educational experience.

COMPENSATORY EDUCATION (CHAPTER 1/TITLE I)

Purpose of the Program

Chapter 1/Title I provides about \$6.7 billion to local educational agencies (LEAs) to improve the educational opportunities of children in high poverty schools by helping those children acquire the knowledge and skills contained in State content standards and to meet State performance standards developed for all children.

As the largest Federal program for elementary and secondary education, Chapter 1/Title I targets those students attending schools having high concentrations of children (ages 5 - 17) from low-income families. Supporting the use of technology, the target audience enlarges to include teachers and administrators who operate the technology either to teach the students, administer Chapter 1/Title I programs, or communicate with each other about various aspects of their Chapter 1/Title I programs. A local educational agency may use funds under Title I schoolwide programs provision in combination with other Federal, State, and local funds, in order to upgrade the entire educational program in a high poverty school. These projects enrich the academic program for the child and for the whole school. It is estimated that 5 percent, or \$425 million, of Chapter 1 funds will go to support school purchases of computer equipment, hardware, and software for the 1993-94 school year.

The Role of Technology

Technology is now a central part of the way Chapter 1/Title I funds are used. The Chapter 1 Technical Assistance Centers (TACs) and Rural TACs provide assistance to State administrators and practitioners on the use of technology, including the use of distance learning. The Chapter 1/Title I TACs and Compensatory Education Program monitoring staff are aware of some technology applications and provide assistance, where appropriate and requested, to State and local jurisdictions on the use of this technology. However, dollars spent for technology typically support computer laboratories in schools that provide only limited access to resources and are primarily used to operate software that drills students on basic skills. Typically, these schools are not electronically linked, e.g., via Internet, to resources outside the school.

The use of technologies that focus on higher Chapter 1/Title I's mission could be advanced by the use of technologies that focus on teaching higher order/complex thinking skills and reading comprehension, aligned with challenging content standards. Information systems that allow practitioners to communicate with each other, store relevant data on promising practices, Chapter 1 distinguished programs, and the application of distance learning technology should also promote the program's goals.

Technology applications funded by other Federal programs that are implemented in Chapter 1/Title I programs should be readily accessed. Such examples would include the National Dissemination Network, Star Schools program, as well as programs from other Federal agencies - in particular, the National Science Foundation, the U.S. Department of Labor, and the National Aeronautics and Space Administration.

In the past, Chapter 1/Title I has sponsored annual national and periodic regional conferences, although that has been superseded in 1994 by an overall Office of Elementary and Secondary Education (OESE)-sponsored conference.

Implementation Plan

Many opportunities exist for the increasing the integration of learning technologies within Chapter 1/Title I. Action steps include:

Promoting High-Quality Software Development

Chapter 1/Title I will collaborate with the Office of Education Technology to sponsor a software forum bringing together buyers and sellers who affect the marketplace, including State and local jurisdictions, vendors, and associations involved with educational technology. Issues to be addressed include:

- guidelines and resources for acquisition and effective use of technology;
- linking technology developments to content standards and new goals for higher order thinking skills of Title I participants and determining how technology will effect content standards;
- requirements, procedures and systems for training teaching staff how to integrate technology with curriculum and teaching; and
- procedures for state educational areas (SEAs) and LEAs to consolidate technology purchases for the purposes of lowering costs and increasing the impact on student achievement gains.

Fostering Research and Assessment

The Planning and Evaluation Service should conduct studies and prepare ideabooks that assess the effectiveness of technology for LEA use, identify barriers to the effective use of technology by SEAs and LEAs, and identify strategies for encouraging the effective use of technology in the classroom.

A research agenda to identify and measure variables influencing the use of technology with at-risk students and in high poverty schools will be developed through collaboration with the Office of Educational Research and Improvement and the Center for Research on the Education of Students Placed At Risk (CRESPAR)

Provide Information and Assistance

To help overcome practitioners' reluctance to use and integrate learning technologies, Chapter 1/Title I should disseminate information about programs that effectively use technology and use

National Diffusion Network funding to support competitive learning technologies demonstration projects. A compendium of recognized project descriptions should be distributed and included in the information will be projects that demonstrate the effective use of technology in the Chapter 1 Recognition Program. The Chapter 1/Title I program will also sponsor technology presentations at the OESE integrated conference in December 1994.

Technical assistance should be given to SEAs and LEAs for planning and technology acquisition, uses of technology, assessments of technology, research finding; and uses of technology included in teacher training.

Compensatory Education Program (CEP) staff should develop a technology training plan for its staff, delivery the training and integrate technology T/A strategies into monitoring procedures. The comprehensive regional technical assistance centers will develop contract specifications for comprehensive centers to provide technical assistance in technology, and also specifications of how TACs will work with Regional Technology Consortia. These centers will supply technology representatives to the proposal review team.

The Internet should be used to identify sources with promising educational technology applications in instruction and management tools, such as the Council of Great City Schools National Urban Learning Network, the Coalition of Essential Schools, the EPIE State Consortium for Improvement. Technology packages (e.g technology products, assessments, assessment procedures, acquisition strategies) will be developed and installed on Internet.

EISENHOWER PROFESSIONAL DEVELOPMENT PROGRAM

Purpose of the Program

The Dwight D. Eisenhower Professional Development Program is designed to ensure that teachers have access to sustained and intensive high-quality professional development that is aligned to State content standards and State student performance standards. This quality professional development will be supported by State and local educational agencies (SEAs and LEAs), institutions of higher education (IHEs), and nonprofit organizations through activities in the core academic subjects. Funding for this program will provide \$320 million to the States to support activities implemented by SEAs, LEAs, State agencies for higher education (SAHEs), and institutions of higher education (IHEs).

The primary target group for Title II are teachers, and where appropriate administrators, other staff, pupil services personnel, and parents.

Role of Technology

Approximately 60 technology programs which have been implemented with Eisenhower funds. These programs included among many things State-sponsored conferences with an emphasis on technology and inservice activities which promoted the use of computers in the classroom. In states with a strong focus on technology, students can utilize video discs, other software and networking capabilities to enhance knowledge in the mathematics and science content areas.

Within the new legislation, states will be required to submit plans as part of their grant application that include a description of how technology will be used to enhance the professional development of teachers.

Several applications can be supported by integrating learning technologies into the program areas. These include:

- Developing and maintaining networking capabilities for all teachers with colleagues in their content area;
- Fostering distance learning technology and applications, especially in rural areas; and
- Expanding the use of Title VI (formerly Chapter II) as it relates to technology and professional development.

Implementation Plan

- Include a learning technologies component as part of the regional teams's function to answer specific questions from States as they begin planning for the integration of technology.
- Utilize the integrated site monitoring team process as a vehicle for stressing the importance of learning technologies.
- Promote computer purchases and professional development activities as a part of the non-regulatory guidance issued from the program office.
- Encourage States to use all Federal sources for the acquisition of necessary technology equipment and training.
- Use conferences as a forum for promoting technology integration such as sponsoring a software conference focused on learning technologies tools that help teachers.
- Expand the use of learning technologies to content areas other than strictly the mathematics and science content areas by encouraging increased attendance of teachers and administrators at educational conferences sponsored by professional organizations which promote the use of technology within all content areas.
- Promote the use of Satellite Town Meetings to provide on-site instruction or sponsor discussions related to professional development in the content academic subjects.
- Conduct a formal study of the use of technology by LEAs, as it relates to teacher training activities. The study should include the amount of funds being spent on teacher training related to educational technology, an assessment of the effectiveness of teacher training, and specific student outcomes as a result of teachers receiving training in technology in their content area.
- Incorporate a section of technology-related questions into the revised State annual performance report forms.

JOB CORPS

Purpose of the Program

Job Corps is a major national training and employment program administered by the Department of Labor to address the multiple barriers to employment faced by disadvantaged youth throughout the United States. A distinguishing aspect of the program is its residential component which enables Job Corps to provide a comprehensive array of services in one setting 24 hour a day, seven days a week. Approximately 90% of its students are residential, with the remainder commuting to the centers daily.

Enrollment in Job Corps is open to individuals aged 16 through 21. The program is open-entry, open-exit, and individually-paced to allow students to progress at their full potential. Each Job Corps site provides a full array of services including: entry diagnostic testing of reading and math levels, work experience programs, health care, occupational exploration programs, comprehensive basic education program, community service through volunteer and vocational skills training programs, and post-program placement and support.

During the past five years Job Corps has made a concerted effort to take advantage of advances in technology in the areas of student records, student pay, and instructional management. Over the next two to five years the CMI System (described above) will become a component of a larger Job Corps Automated Data Processing (ADP) System. The new ADP system will facilitate interconnectivity between the existing Job Corps data systems, including the Student Pay and Allotment Management Information System (SPAMIS), and new systems, including a standard local MIS, a Scheduler, and other program components.

Role of Technology

During the past two years, an innovative Computer Managed Instruction (CMI) system has begun to be phased into all Job Corps education programs. The CMI system is designed to automate many of the tasks that instructors and administrators have traditionally found to be tedious and time consuming. By eliminating manual records and assisting with the scoring and recording of assignments, the system frees instructors to spend more time with students in individual and small group instruction. The immediate acceptance of the system by students and teachers is a strong indicator of the further benefits to be gained by implementing learning technologies more fully into the delivery of training services by the Job Corps.

Currently, the CMI Systems provides automated instructional management for basic reading, graded reading, math, GED, writing/thinking skills, and world of work. Planned expansion for content areas include the Vocational curricula, Social Skills Training, Student Orientation, and Student Progress Evaluation.

The CMI system enables Job Corps to offer a comprehensive, integrated education approach that allows teachers to assign instructional materials based on individual student needs. By means of computer-managed diagnosis, assignment, testing and tracking, the new Job Corps Education

Program links the best conventional materials and audio-visuals with computer-assisted instruction, in a technologically advanced and individually responsive educational system.

Not only have the CMI System terminals in the classroom served to motivate students, they have also increased the students' responsibility for their academic training. Being able to logically think their way through the system by selecting menu options and choosing prompts to update their progress, students increase their computer literacy and acquire valuable workplace skills.

FY'95 funds have been set aside by Job Corps to pilot educational software packages in an Local Area Network environment. While several packages have been contemplated for review, DoD's *Fundamental Skills Training* (FST) stands out as an excellent package of materials. A preliminary examination of this material indicates that this "Intelligent Tutoring System" could serve as an excellent supplemental package for Job Corps' education program. Job Corps plans to pilot these materials in FY'95, if arrangements can be made to obtain software support within its existing budget parameters.

Implementation Plan

Based on the earlier success of the introduction of the CMI system and the potential use of DoD developed learning technologies, Job Corps should: include the potential use of Learning technology in all Job Corps classrooms, shops, dormitories, and offices as a part of all future procurement; and enter into a regular dialog with DoD to review their training materials for adoption into Job Corps curricula. The general education, technical training, and workplaces skills learning technology developed by DoD may have the potential to greatly enhance the interpersonal and teamwork skills, thinking skills and basic academic skills presently taught in the Job Corps Curricula.

Job Corps should organize a three year demonstration project on the effectiveness of transferring DoD developed learning technologies into the Job Corps program. Three years would be needed to identify and modify existing DoD software for Job Corps use, implement the application at up to three pilot centers equipped with trained staff to utilize a fully integrated training delivery system, and evaluate its impact on Job Corps students. In order for a valid pilot to be conducted, up to 2.5 million a year from sources other than the Job Corps budget would be needed. Subject to availability of funds, pilot centers could begin participation in early 1996.

Specific Applications

Job Corps has identified a number of specific learning technologies programs which demonstrate potential for application to the Job Corps training program. These programs, identified below, could greatly enhance vocational training program in two ways. First, particular programs have been identified that could serve to assist national policy makers to more effectively match vocational training offerings with regional job market conditions. Secondly, DoD has developed several automated authoring systems that offer Job Corps trainers the capability to more economically and efficiently plan lessons and author their own software.

What follows are descriptions of specific programs that have been identified as offering a potential application to Job Corps.

Fundamental Skills Training (FST): The FST is an adaptive, computer-based training system that provides diagnostic, individualized instruction to students. The Department of Defense's Armstrong Laboratory developed this program to improve 9th grade critical thinking skills in mathematics, reading/writing, and science. Its Word Problem Solving tutor focuses on teaching students to analyze word problems and write correct equations. In addition, its reading/writing and science programs help students and instructors analytically approach these areas. The programs use state-of-the-art color graphics and can be adapted to students performing at different competency levels.

Intelligent Computer-assisted Training Testbed: A program designed to provide a proof of concept and demonstration of how this can be achieved by developing, testing, and demonstrating prototype software tool, called authoring shells in the field. ICATT could allow Job Corps instructors and curricula developers to economically author their own training software. At the very least, the program may allow the Job Corps training community to develop a comprehensive criterion referenced test bank which could be used throughout its system.

Virtual Environment Based Intelligent Tutoring System Authoring Tools: Software will allow instructional designers and subject matter experts with little or no computer experience to develop, deliver, and maintain programs that use virtual environments to train students how to perform a variety of tasks. If proven cost effective, this technology could allow Job Corps centers in remote areas to offer training not available from either local institutions or employers. Such programs might also provide training at centers without the purchase of costly training equipment.

Training Impact Decision System and Intelligent Instructional Design Tools: Programs developed to support tools that simplify the design and development of high quality learning systems. Such programs could provide Job Corps training specialists with tools to design new training programs and the ability to quickly and effectively up-date them.

Training Efficiency and Effectiveness Methodology: A management information system that is designed for training managers and course personnel. The program could allow Job Corps professionals to compare the amount of time spent in training on a task with the field recommended training emphasis for that task. This could allow instructors to provide a more balanced and employer driven training program.

ADULT BASIC EDUCATION AND LITERACY PROGRAMS

The Purpose of the Program

The purpose of the Adult Education and Literacy programs is to provide basic educational opportunities for adults over the age of 16, not currently enrolled in school, who lack a high school diploma or the basic skills to function effectively in the workplace and in their daily lives.

Courses of instruction include Adult Basic Education (ABE), Adult Secondary Education (ASE), and English as a Second Language (ESL). Within this cohort of adult learners, adults with disabilities and those enrolled in the ESL program are particular target groups with regards to technology use. The 1994-95 Program Year budget for the Basic Grants to States Program totals \$254.6 million.

The Role of Technology

Integrating learning technologies into this program can help adult learners in many ways. It can help stretch Federal, State, and local dollars to expand program resources, improve program quality, and reach larger numbers of adult learners. It can assist adults with disabilities, reach learners outside of classrooms, help learners use time efficiently, raise interest and sustaining motivation. Learning technologies can also promote individualized instruction, provide access to information tools, improve curriculum, enhance assessment and evaluation, and serve as a magnet for fund raising and business contributions.

The most relevant technology applications to improving adult basic education and literacy programs include computer-based technologies, telecommunications technologies, and consumer electronic devices.

Certain sections of the Adult Education Act (AEA) as amended by the National Literacy Act (P.L. 102-73) of 1991, facilitate the use of technology. These sections are the following:

- **Experimental Demonstration Projects and Teacher Training**

Of the funds allotted to a State under section 313 for each fiscal year, not less than 15 percent are to be used for special projects that involve the use of innovative methods, systems, materials, or programs which may have national significance or will be of special value in promoting effective programs. This would include projects that are introducing or expanding the use of educational technology into adult education and literacy instruction. Of these funds, at least two-thirds must be used for teacher training. This could include preservice and inservice instruction concerning the use of technology in adult education and literacy programs. [Sec. 353]

- **Purchase of Hardware and Software**

Up to 10 percent of the grant funds received under the program of State Literacy Resource Centers can be used to purchase computer hardware or software. [Sec. 356(f)]

- **Workplace Literacy**

Grants awarded under this program may include the establishment, as appropriate, of technology-based learning environments, such as computer-based learning centers. [Sec. 371(c)(2)(E)]

- **Instructor Training and Technical Assistance**

Funds provided to each State under the program of State Literacy Resource Centers are authorized to conduct activities to provide training and technical assistance to literacy instructors in selecting and making the most effective use of state-of-the-art methodologies, instructional materials, and technologies such as computer assisted instruction, video tapes, interactive systems and data link systems. [Sec. 356(d)(7)(A)]

- **Research in the Use of Technology in Literacy Programs**

The National Institute for Literacy, authorized under the National Literacy Act of 1991, is empowered to conduct basic and applied research and demonstrations on literacy. The Institute studies the best methods for assisting adults and families to acquire literacy skills, including the use of technology. It also evaluates the use of technology and other studies which will increase the literacy knowledge base, use but not duplicate the work of other research services, and build on the efforts of such other research services... [Sec. 384(B)(iv),(vii)]

- **State Advisory Council on Adult Education and Literacy**

Each State advisory council is to advise the Governor, the State education agency, and other State agencies concerning the improvement of the quality of literacy training programs in the State by supporting, among other areas, technology-based learning. [Sec. 332(f)(2)(C)]

Implementation Plan

Reauthorization of the Adult Basic Education Act is an opportunity to expand and highlight technology provisions intended to serve more adults, to improve the quality of program services, to increase staff inservice, and to strengthen program evaluation.

This issue involves examining: 1) the impact of current Federal and State requirements concerning matching and/or supplanting of funds on the use of technology; 2) mechanisms available to leverage Federal dollars with funding from other Federal agencies and from State, local and private sectors to promote the use of technology; 3) creation of clear policies supporting the expanded use of technology; and 4) authorization for collaborative efforts with other ED programs and with other Federal programs and agencies (see Appendix A).

Technology was included in the FEDERAL REGISTER Notice of September 20, which invites comments on issues to be considered during the reauthorization process. Recommendations on alternative ways to use technology more effectively are among the comments being gathered at public reauthorization hearings and at meetings held with the adult service providers.

Currently the Division of Adult Education and Literacy (DAEL) has several initiative either underway or planned to extend the use of technology in adult programs. These efforts are as follows:

Conferences

Teacher Training Using Interactive Teleconferencing involves collaboration between DAEL, National Center on Adult Literacy (NCAL), the Public Broadcasting Service's Adult Learning Systems unit, and Station WHYH Public Television to design and produce four interactive teleconferences for adult education and literacy service providers.

This video series is addressing the need for high quality, accessible, innovative, cost-effective professional development while testing and demonstrating the feasibility of distance education for teacher training. The first video teleconference, held on April 28, 1994 and viewed at more than 850 sites, focused on *Technology: New Tools for Adult Literacy*. The December teleconference discussed strategies to improve math education for adult learners. Workplace literacy is scheduled to be the topic for a spring video teleconference, while family literacy is scheduled for the fall of 1995.

NCAL and DAEL co-sponsored a national invitational software developers conference on October 18 and 19, to convene federal and state policymakers, local adult education providers, software publishers, and research and development specialists in technology and adult education. Participants explored new approaches to stimulate the development of quality adult education software which sustain motivation, improves curriculum, and uses learning time effectively. A follow-up workshop will be held in January 1995 to consider the progress made since the conference and to refine ideas concerning "next steps."

DAEL will work with the State Literacy Resource Centers, NCAL, and the National Institute on Literacy to combine information about available quality software and to disseminate this information to the adult education community.

Electronic Communication Efforts

DAEL is supporting several activities which pilot the use of technology to help manage complex recordkeeping and accountability requirements for Federal programs. The Division of Adult Education and Literacy is using National Adult Education Program funds to develop and implement an electronic state management information system called FASTR which will enable State staff to transmit Federally-required reports to the Federal staff electronically. In addition, the Division is supporting development and implementation of a local electronic data collection system called AEMIS which will enable local adult programs to transmit student enrollment and other program data to their State offices electronically.

An electronic communication system, called DiAL-IN, which enables the State adult education and the State Literacy Resource Center staffs to communicate directly with the Federal staff is also being supported.

DAEL will explore linking the electronic communication systems it is supporting to the Internet in order to extend the usage of the systems and, wherever possible, eliminate any duplication of effort.

Distance Learning Initiatives

A project to form collaborative partnerships for distance learning is being planned. To support this effort, a paper on distance learning options within the adult education community was commissioned. The distance learning initiative envisioned to be a competitive award which brings together both public and private sector service providers to expand access to adult literacy instruction.

Distance learning capacity building will be encouraged by strengthening collaborative efforts between DAEL, the Star Schools Program, the State Directors of Adult Education, the Directors of the State Literacy Resource Centers, and local service providers.

DAEL should develop a plan to evaluate the current distance learning efforts of the States. From this assessment, new strategies for collaborative distance learning efforts will be developed. Information on resources facilitating distance learning will be disseminated to the field.

Federal Interagency Cooperation

DAEL is in the process of developing a Memorandum of Understanding among several Federal agencies concerning the collaborative use of learning technologies by the adult education community, to expand the adult education services.

Draft

JOB TRAINING PARTNERSHIP ACT (JTPA)

(Information not yet received)

CARL D. PERKINS VOCATIONAL AND APPLIED TECHNOLOGY ACT

Purpose of the Program

The purpose of the Carl D. Perkins Vocational and Applied Technology Education Act is:

to make the United States more competitive in the world economy by developing more fully the academic and occupational skills of all segments of the population. This purpose will principally be achieved through concentrating resources on improving educational programs leading to academic and occupational skill competencies needed to work in a technologically advanced society. (20 U.S.C. 2301, § 2)

The Carl D. Perkins Act is administered primarily through a Basic Grant program which funds States and localities with formula grants that are used to improve the quality of vocational education programs for students of all ages.

The Perkins Act also funds tech-prep education, tribally controlled postsecondary vocational institutions, state councils of vocational education, and national programs including demonstrations, research and data systems.

The Act contains equity provisions to ensure that students who are members of "special populations" are provided full access to programs and the supplemental services they need to succeed. Members of "special populations" include low-income individuals, low-achieving individuals, individuals with disabilities, individuals of limited English proficiency, individuals in programs designed to eliminate sex bias, and individuals in correctional institutions.

Role of Technology

Technology can advance the mission of the Perkins Act by contributing to the development of high standards and quality outcomes for vocational education programs and by improving the delivery of services.

The 1990 amendments to the Perkins Act contain key provisions which can be better implemented through the use of technology. Learning technologies could be especially helpful in improving the quality of instruction for special populations. In remote areas, distance learning, simulated work environments and other applications of technology may provide higher quality learning experiences for students.

Many of the newest technology applications that are useful in other disciplines are just as powerful, when adapted, for vocational-technical education. For example:

- Personal Computers: Can be utilized by Vocational-technical students to retrieve data, communicate, and learn key programs used in the workplace (word processing, spreadsheets, databases, and design).

- Electronic mail: Provides access to research databases and special periodicals as well as the possibility of working on projects with students across the world.
- Interactive videodiscs: Can store and retrieve massive amounts of information in the form of video, sound, and text - which all provide high quality lessons in diverse occupational areas.
- Intelligent Tutoring Systems: Provides students with unlimited practice on a variety of topics, from a medical technique to brake repair, and can move ahead to more complex materials when prepared. This tool is also useful as an assessment technique.
- Simulation Software: Allows design students through the use of software such as AutoCAD to create a drawing without ever touching a pencil. DOD has been a leader in the development of such software with applications in everything from construction technology to jet engine repair.
- Distance Learning Tools: Increases the possibility of equal access to a quality education for all students, especially in rural areas where resources are limited for some programs.

Title IV of the Perkins Act (20 U.S.C. 2412) contains extensive provisions for the Secretary of Education to make grants to non-profit educational telecommunication entities to produce and distribute instruction material and services. Grants awarded pursuant to this section may be used to provide:

- A sequential course of study that includes either preproduced video courseware or direct interactive teaching delivered via satellite, accompanied by a variety of materials and computer-base instructional materials;
- The development of individual or a series of videodiscs that supplement instruction.
- Videodiscs that produce simulated hands on training; and
- Teacher training programs.

Implementation Plan

- Review Perkins state plans to ascertain whether or how states have addressed educational technology usage.
- Identify a research agenda on the status of educational technology usage in vocational technical education and suggested policy actions.

- Include in the reauthorization proposal for the Perkins Act (FY 96 submission for FY 97 budget proposal) provisions which encourage the use of educational technology in vocational-technical education. The provisions should focus on: 1.) providing learners with the skills needed in a technologically advanced workplace; 2.) increasing the usage of cutting-edge learning tools; and 3) using networks that link learners to new resources.

Research funds for the development and dissemination of educational technologies, professional development, equipment purchases, and best practice demonstration projects should be targeted resources.

- Increase learner access to up-to-date workplace technology through increased linkages with School-to-Work systems and greater partnerships between schools and industry.
- Explore the possibility of using demonstration projects (under existing authority) as models of educational technology usage as a way to improve program quality.

ONE STOP CAREER CENTER SYSTEM

Purpose of the Program

The purpose of the One Stop Career Center System (OS) is to help integrate the delivery of career transition information and services into a "reemployment system." There are several paths being used to create this system: 1) implementation grants to states to create statewide systems, 2) planning and development grants to states for the same purpose, 3) grants to local systems to serve as learning labs, 4) grants to state to improve the quality of their labor market information (LMI) systems, and 5) research, development, and operations consortia of states to support the LMI initiatives.

Services to be integrated into the OS include at a minimum the following programs: JTPA Titles II, III (EDWAA), the Employment Service, and Unemployment Insurance. States are encouraged to integrate education (e.g., Carl Perkins, School-to-Work, community colleges) and social service programs (e.g., JOBS) into the OS.

The goal is to provide a seamless system of service delivery to all persons in the labor force, job seekers, and employers.

Role of Technology

There will be four primary uses of visible technology: 1) linking service providers to reduce the need for redundant paperwork/applications, 2) delivery of career and labor market information and information on services, 3) as part of electronic labor exchange systems, and 4) as part of the training to be provided to some job changing or non-job-ready customers. There will also be uses of technology for program evaluation and data gathering which are likely to be invisible to most of the customers.

Learning technologies would be useful in many of the One-Stop centers which will offer basic skills training. Management Information Systems (MIS) and case management technology are critical to making the one stop systems work in most states. Most states will also depend on some form of remote access (e.g., voice response, dial-up modem, Internet, kiosks) to provide access to people who cannot reach the physical centers.

One-Stop envisions using technology to provide customers with career and labor market information, much in a self access form. The System also envisions a substantial expansion of the electronic labor exchange function.

Implementation Plan

- Promote, encourage, and "incent" the use of learning technologies in subsequent State and local solicitations for grant awards. Already, the first round of grants to states have been awarded. All six winners of the One-Stop implementation grants proposed the use of technology in the four visible areas. A second round, with 8-10 states is anticipated for

award in mid-summer, 1995.

- Promote the use of technology and conduct research on the application of technology through the state consortia and a national clearinghouse.
- Promote the use of technology in future grants by sponsoring a technology fair in conjunction with future bidders conferences. Have the technology fair not only display exhibits but also include formal learning tracks (like formal concurrent workshop tracks).
- Focus technical assistance more heavily on the application of learning and other technologies. One mechanism would be for someone with technology experience and expertise from other federal programs (e.g., Defense, Energy, Commerce's NIST program) or a loaned Executive to join a combined School-to-Work/One-Stop Team.
- Have the local learning labs showcase technology.
- One-Stop is likely to have at least two annual technical assistance/bidders/winner conferences where technology can be displayed and specific tracks can be formed to walk people through them. The goal of these conferences will be to bring together new federal grant recipients and people hoping to get a federal grant with the hopes of influencing these people early in their decision making process.

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REHABILITATION ACT

(Information not yet received)