ATTACHMENT 3

BACKGROUND ON THE ETR SEMINAR ON IMPROVING THE PRODUCTIVITY OF LEARNING

The Education,, Training, and Reemployment (ETR) Policy Group's Seminar on Improving the Productivity of Learning will explore the potential role of learning technologies in implementing the Clinton Administration's lifelong learning agenda. Our goal is to look together at strategies for accelerating the development and adoption of technologies that can achieve a major leap in the productivity of learning. In the process, we hope to show how new technologies can make active learning more effective because it is engaging and fun, as well as demanding. We will begin by discussing a possible initiative that could focus national interest on developing a new generation of learning tools that can engage learning communities all across the country (see Attachment 4), and we will close by taking a look at some of the learning technologies that the Department of Defense (DoD) has developed that can be transferred to the civilian education and training sector.

Background on the ETR Policy Group

The ETR Policy Group was created by the President in February. It is co-chaired by Carol Rasco, Assistant to the President for Domestic Policy, and Bob Rubin, Assistant to the President for Economic Policy, with Bill Galston (Deputy to the President for Domestic Policy) and Paul Dimond (Special Assistant to the President for Economic Policy) heading up the work of the Policy Group. Members of the Policy Group include the Department of Labor, Department of Commerce, Department of Education, Health and Human Services, and the Department of Defense. The mission of the Group is to coordinate existing Administration policies in education, training, and reemployment, and to consider complimentary new activities that will help implement the President's lifelong learning agenda. Already this year, Head Start, Goals 2000, the School to Work Opportunities Act, and restructuring of the Student Loan Program have been successfully launched. Major transformation of ESEA and the unemployment system are now pending, along with a complete review and overhaul of all federal education and training programs for adults. The purpose of this seminar is to consider how technology provides an opportunity to improve learning for students of all ages in a system of lifelong learning.

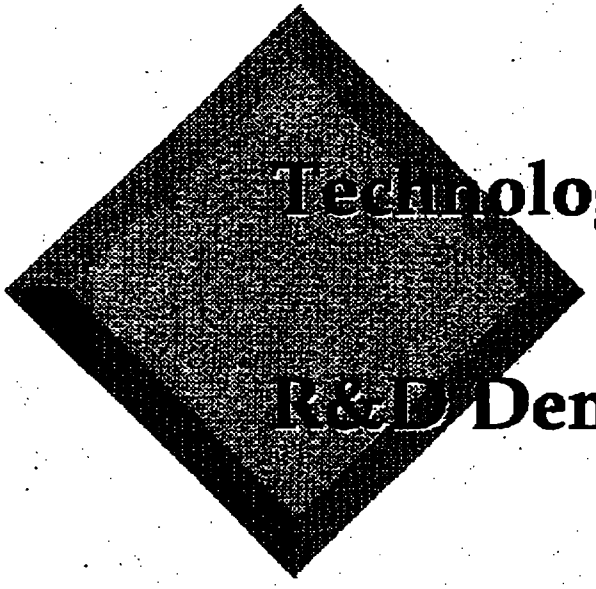
Background: DoD and Learning Technology

In the past half century, the Department of Defense has invested substantial amounts of money, energy, time, and thought to improve the skills and readiness of its workforce, the U.S. Armed Forces. This investment has involved research and development in both instructional processes and their application to learners of different backgrounds and ability levels. Technology has been key to these efforts and is becoming even more essential. These investments cover: (1) active learning from a distance through interactive networks; (2) portable learning that is available to personnel in classrooms, workplaces, and homes; (3) simulation technology to replace expensive, environmentally harmful, and/or dangerous

learning experiences; and (4) embedded instructional sequences in operational equipment. This DoD investment can now be leveraged to enhance the productivity of learning in other sectors.

Background on Improving the Productivity of Learning

The information, simulation, and communication technology that is beginning to be used to improve productivity throughout the economy has the potential to create a revolution in learning. First, technology can make time spent in learning more productive by making learning more like an individual tutorial than a mass-production experience, and by creating apprentice-like settings where individuals and teams are free to explore, play, and make mistakes. Second, technology can increase the amount of time spent in learning throughout a person's career by making compelling learning environments accessible in homes, offices, schools, and libraries. For young people, technology, if used properly, has the potential to revolutionize the way in which children and adolescents spend their out-of-school time by allowing round-the-clock access to interactive learning software (games, information, instructional videos, etc.). This same technology will give adults the flexibility of learning whenever and wherever they choose, whether over a lunch-break or late at night after the children are asleep. Third, technology can reestablish links between parents and schools, between learning and practical work, and between communities of learners by linking homes, schools, and offices together. The purpose of the Seminar is to agree on a vision of what can be accomplished in this critical area and a concept for how we can create a sense of national excitement and purpose around this vision.

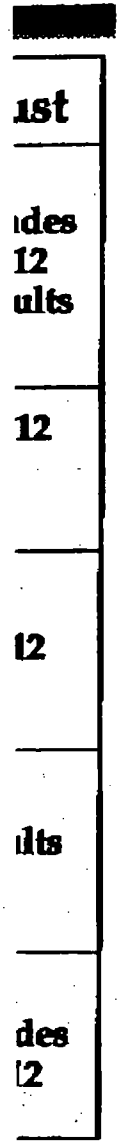


Technology Learning Challenge

R&D Demonstrations

Technology Learning Challenge
Demonstration Characteristics

Demo	Goal	Key Features	Cu
Learning Enviroments of the future	Use advanced technologies for increase productivity of teaching and lifelong learning	• Math/science simulation • Intelligent tutors • Guided distnce learning	• Grac 10-1 • Adu
Virtual Apprentice	Enhance School to Work transitions	• Immersive environments	K-1
Educational Mission to Planet Earth	Repurpose Earth/Science data for standards based science curricula	• Distributed access to complex data sources • Visualization	K-1
Incumbent Worker Training	Enable workers to acquire new skills required in the 21st century workplace	• Just-in-time learning • Individual skills training • Self assessment	Adul
Interactive Avaition Environments	Exploit interactive simulated environments to improve understanding of aeronautical science	• Distributed interactive simulation • Collaborative problem solving	Grad 6-1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Demonstration Attributes

- Scalable
- Sustainable
- Adaptable
- Distributed
- Accessible and ubiquitous
- Public-private
- Managemment
- Commercialization of products

Technology Learning Challenge

Task 4

Digitization

Task #4 ("Digitization"): 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

Task #4 ("Digitization"): Preliminary Assessment

Area	Key Organizations	Current Status	Key Needs
Research & Development	NASA NOAA NSF ARPA	● Focus on info retrieval tools — Joint (NSF, ARPA, NASA) agency effort: $6M/yr for 4 years (begun in FY94) — NASA: Public use of Earth, science data over Internet: • $3.7M (FY94) • $11.8M (FY95) • $20.0M (FY96) (requested)	● Improve techniques for digitization
Building collections	NARA L of C Smithsonian	● L of C: American Memory Project ($1M/yr for 4 years) (completed) ● Smithsonian: $1M	● Fund collection development, tie to grant-making ● Interagency effort by subject category ($4M, unfunded)

Task #4 ("Digitization"): Preliminary Assessment (Concluded)

Area	Key Organizations	Current Status	Key Needs
Dissemination	GPO NTIS	• OMB: Source of current effort • L of C: operationalization of Electronic Copyright Management System • Rollout of Government Information Location Service (GILS)	• NARA: provide access ($1M requested for FY94) • Rationalization effort (DoC study as baseline)
Grants	NEH NARA	• NEH: $11M (FY95)	• NEH expansion: $21M (FY96 request) • LSCA reauthorization: from construction to digitization

Task #5 (Interactive Hardware Connections): Status

- **Established a systems context for addressing the issues posed**
  - Identified key questions to address to characterize the problem
  - Formulated alternatives for each question
- **For the issues posed**
  - Identified two strawman candidates for each issue
  - Performed preliminary assessments of the strawmen

Task #5 (Interactive Hardware Connections): Preliminary Options and Assessments

Issues	Options		Preliminary Assessments	
			Pro	Con
Legislation	Preferential rates		• Cost	• Regulatory structure could impede swift deployment
	Require minimum service		• Uniform minimum national standard	• Response time slower than technology change
Model Practice	Successful programs to emulate		• Easy, quick	• Possible technology obsolescence • Unsuitable for new application
	Utilize experienced consultants		• Experience • Speed • Turnkey operations	• Cost
Funding	Internal		• Quick	• Limited resources available • Cultural resistance
	External	- Government	• Extension of current methods	• Tight budgets • Resistance to new assessments/subsidies
		- Harness competition	• Lower costs • Self sustaining	• Start-up hurdles

Task Force on Learning & Technology
#6 Use of Technology in Major Federal Programs

Tasks:

- Define how learning technologies can be used to improve the effectiveness of the program
- Ensure that the program makes efficient use of technological expertise available in other federal programs
- Stimulate innovation and growth in firms supplying learning technology products and services under the program

Deliverables: For each program area:

a. A brief description suggesting how learning technologies could further the mission of the program during the next 5 plus years

b. Specific actions possible in FY95 for accelerating use of innovative learning technologies using existing authority and funding. These would involve changes in program management possible under existing authority

c. Options for FY96 requests

d. New legislative authority needed to ensure effective use of emerging information technology

Due: 4 Nov

Task #6 ("Major programs"): Status

- For several of the major Federal Programs on education, preliminary assessments have been made of opportunities to accelerate the use of learning technologies
- Activities are underway to
  - Refine these assessments
  - Identify FY96 programs for expanding the TLC
  - Explore inter-program opportunities to encourage the development and sharing of learning technologies

Task #6 ("Major Programs"): Preliminary Assessment

Program/ Organization	Uses of Learning Technologies	
	Current	Planned/Potential
Job Corps/DoL	• Computer Managed Instruction (CMI) system	• Make CMI a component of a larger Job Corps ADP system (planned) • Establish 3 pilot centers to provide a fully integrated training delivery system ($1.25M, unfunded)
Chapter I/DoED	• $400 M/yr supports school purchases of – Computer equipment – H/W – S/W	• Support – Connections to networks – Instructional applications of higher quality

Task #6 ("Major Programs"): Preliminary Assessment (Concluded)

Program/ Organization	Uses of Learning Technologies	
	Current	Planned/Potential
Head Start/DHHS	• Limited uses in several areas: – Classroom tool • Demo project (IBM-provided H/W) • Testing PBS' Ready to Learn program – Training teachers • Satellite training program in South Carolina – Resource to programs • National Bulletin Board System (BBS) – Parent learning tool; grantees pursuing • Literacy teaching • Job skills development training • Parenting skills – Reaching special populations • 3 demos for children with disabilities	– Resource to Programs • BBS may become part of a national interactive info system (with DoC)
School to Work (STW)/DoED	•Venture Capital Grants to state, local partnerships to build STW systems (technology application encouraged) •Tech assistance funds (earmarked under "National Activities") may be used to explore learning technology	•Increase encouragement of use of learning technologies in state, local grants •Focus tech assistance, research more heavily on application of learning technology •Use "National Activities" funds to operate pilot technology demos

Task #6 ("Major Programs"): Opportunities to Expand Technology in Education

- **Opportunities to expand the uses of technology in education in FY96 have been identified for the following programs (in priority order);**
  - — **ESEA Technical Assistance (Currently under reauthorization); assistance for**
    - **Chapter 1**
    - **Other elementary, secondary school education programs**
  - — **School to Work Opportunities Act/Perkins/JTPA**
  - — **TIIAP**
  - — **Job Corps**
  - — **ESEA Technology National Programs (currently under authorization)**
  - — **Eisenhower Professional Development Program**

Task #6 ("Major Programs"): Inter-Program Opportunities

- **Consideration is being given to the following opportunities to promote inter-program activities**
  - **Technology transfer (DoE, DoD, NASA)**
  - **Direct purchase**
  - **Influencing purchases of technology**
  - **Impact on S&E budget**
  - **Standards**
  - **Technical assistance and training**

Task Force on Learning & Technology
Outreach

Tasks: Contact key stakeholders and potential collaborators in education, training, and state/local government to identify programmatic needs. Business interests would include communication, entertainment, software publishing as well as business organizations with broad interests in improving the quality of US education

Deliverables: Hold a series of focused workshops and seminars aimed at identifying the barriers to expansion of learning technology in different markets

Due: Nov 4

Task #7 ("Outreach"): Status

- Stakeholders from seven groups have been targeted
  - Educators
  - Trainers
  - Policymakers/gurus
  - CEOs/corporations
  - Association heads
  - Representatives of successful models
  - Customers
- A series of briefings/workshops are anticipated to
  - Elicit stakeholder reaction to the TLC
  - Catalyze support
  - Seed their respective communities
- Drawing upon preliminary inputs, work is in process to
  - Assemble a list of the individuals to be invited
  - Formulate logistical plans (e.g., meeting locations, dates, times)

GOAL:

Launch a national program using the power of modern information technology to achieve the Administration's lifelong learning goals -- specifically Goals 2000 and School-to Work

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THE VISION:

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

Communication systems can connect homes, schools, workplaces, and vast information resources leveraging time at home

These learning environment can lead to a quantum (2-sigma) improvement in learning productivity

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THE CHALLENGE:

The technology of computers, communication systems, multi-media systems is advancing at a rapid rate. The Administration's National Information infrastructure strategies are ensuring universal physical connectivity. Investment in the development of high-quality learning systems has greatly lagged 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 instructional staff.

OUR APPROACH:

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: a

community based grant program for innovations in learning technology patterned roughly after the administration's highly successful empowerment zone program.

2. *Ensure effective use of technology in all relevant federal programs including:*

   - federal training for DoD and Civilian employees
   - technology used wherever it is cost-effective in federal education and training programs
   - combined procurements can stimulate private development of products

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

A POWERFUL POLITICAL MESSAGE:

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.

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

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

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PROGRESS TO DATE

1. ETR Working Group established to explore opportunities in each area

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

3. DoD hosts a workshop for Deputies on July 9th

4. Working groups provide key decisions for FY96 budget for discussion at this ETR meeting. Focus today will be on issues requiring immediate decision, specifically:

    - size and structure of the new grant program

    - management and funding for technology and learning R&D

NEXT STEPS:

Based on decisions made in this meeting, Agencies will include elements of a coordinated technology and learning program in their FY96 budgets

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

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 goals-2000 and school to work objectives

Why Is It Needed:

- major underinvestment in content

- markets for learning technology are fragmented and hard to reach -- particularly in schools and small businesses

- requirements for developers are poorly defined

- ~~result is extremely high development investment~~

- 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 proposals. As in the case of the empowerment zone proposals, the most important achievement of the challenge is likely to be the building of community teams that can work together to improve instruction even with little or no federal assistance.
The grants would cover content not hardware -- hardware investments would be provided by the proposal team (state and federal funding from other programs would be eligible)

Which Communities Would Be Encouraged To Apply:

- communities linked by geography ~~or by some other interest~~ communities linked by some other interest:
- disabled groups
- groups interested in teaching math, science, history, or some other specialty
- small businesses with a common training problem

Who Could Propose: - complex training communities, colleges & universities

Proposals would need to include: school systems, 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, incumbent workers, Higher Ed
- do they offer creative new solutions
- is concept applicable to other communities
- are there plans to market the concept more widely
- 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

How Much Would It Cost:

The central questions 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

10 grants for $5 million/year for 4 years
100 grants for $200 thousand/year for 4 years

total: ~~$70 million/year~~ $100 million/yr

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 K-12 (~~not~~ including school to work ~~or~~ adult training) and a series of formulas may further restrict use. but not

NASA and DOE spend $100-200 million annually on education programs. Much of this is earmarked and most is spent on federal laboratory staff and not available for funds-out programs.

Management: depends on funding option, but assume some sort of interagency coordination in any scenario

The program would operate under the umbrella of an interagency board (DoD, DoED, DoL, NSF) like the Empowerment Program Board. Reviews would be undertaken by an interagency team operating like the Technology Reinvestment Program board.

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
- links to ESEA program could

Option (2) Direct all funding to DoED

Pro:

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

Con:

- administration difficulties in getting education programs through appropriations committees

Option (3) Combined program with programs for children (pre-school through 12th grade 12) funded through DoED and programs for school-to-work and adults funded through DoD/ARPA.

Pro:

- follows successful model of Empowerment Zones using HUD and USDA funding

• best chance at getting all the $ we need

- budget impact comparatively small in each agency

Con:

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

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SEPARABLE DECISIONS

A. What Could The Federal Government Offer Winners Other Than Direct Funding

- rights to help set priorities for digitization of federal resources (e.g. in the Smithsonian or National Archives)

- access to resources of federal laboratories or other facilities (possibly prearranged as a part of the application process)

- access to funding for connectivity by combining application with application for DoC/NTIA

- access to state funding for hardware by combining federal and state decision reviews

include ~~basic~~ high risk research & demos

B. ~~Should The Government Fund Demonstration Projects Separate From The Challenge Grants?~~

Option (1): Leave All R&D To Entrepreneurs Except For Projects Financed by Mission Agencies Such As DoD For Specific Training Tasks And A Small Program At NSF

Pro:

- Allows maximum funding for competitive challenge grants
- Least disruptive to existing agency activities

Con:

- Private firms may underinvest in high-risk projects with returns possible only after many years

Option (2): Create A Coherent National Program For R&D In Learning

Pro:

- Puts learning technology research on a par with research on health, energy, agriculture, and other key public goals

- Disciplines unfocused and possibly inefficient agency programs

Con:

- More costly and more politically difficult
- Must justify why public organizations have a comparative advantage over private research (the old winners and losers argument)

MANAGEMENT OF A COHERENT FEDERAL R&D PROGRAM

In all options the lead agency would be the recipient of some additional funding for learning technology and would be responsible for crafting an interagency plan that would be reflected in all agency budgets

Option (1): Center activity in NSF

Pro:

- Home of virtually all civilian experience in supporting learning technology
- Institutional interest in expanding efforts in the area as well as expanding investment in related social and behavioral sciences

Con:

- No clear history of fostering commercial enterprises (focused primarily on university research)
- Central interest in science and mathematics and not in history, economics, or other fields not directly associated with science
- No clear capability in managing interagency projects

Option (2) Center activity in DoED

Pro:

- Chairs CET committee with similar obligations
- Mission covers a broad range of learning areas
- Targeted for a new, and significant program in education technology for FY95.

Con:

- Difficulty in obtaining additional funding from Congressional appropriators
- No history of funding programs that lead to business development (primary focus on public educational institutions)
- No clear capability in management of interagency projects

Option (3): Center activity on fundamental research and component development in NSF and applications/demonstrations in DoED

Pro:

- NSF expertise in basic research areas and DoED in applications

Con:

- Weaknesses of both agencies listed earlier

Funding Available:

Funding Requirements:

Fundamental Research	5-10	NSF/DoED
Demonstrations (3-5@ $5Million)	15-25	DoD/NSF/NASA/DOE
Challenge Grant	50-150	DoED/DoD
Digitization	5-10	NSF/SI
Program Demonstrations	2-5	DoL/DoED
Total	**77-210**	

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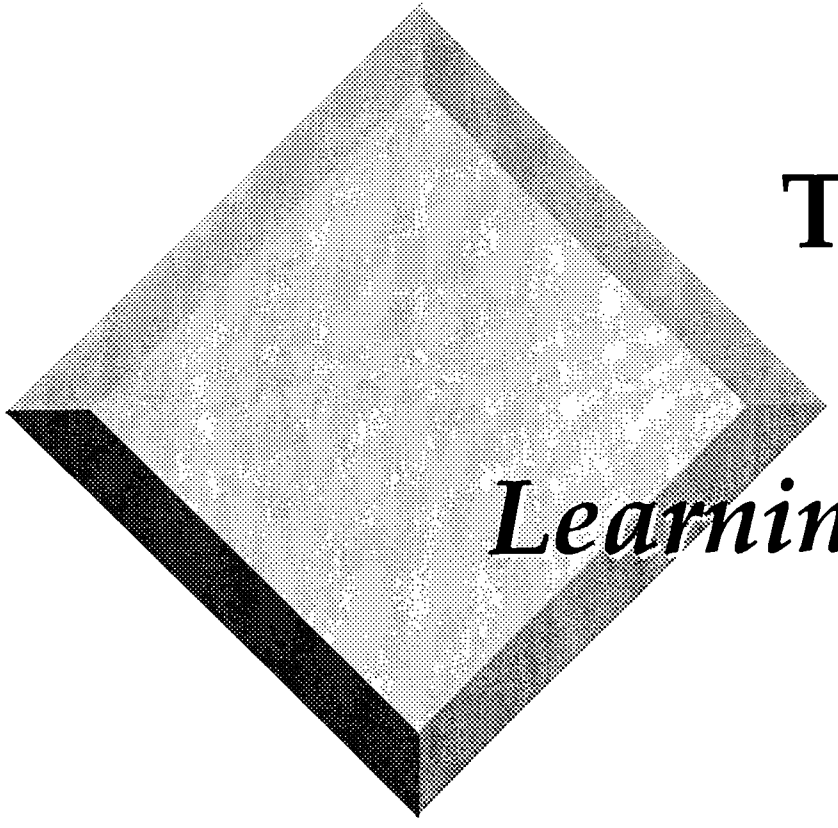
(C) Digitization

(D) Program funding



Task Force on *Learning & Technology*

20 July 1994

Task Force on Learning & Technology

Background on ETR Learning and Technology Project

Four working groups prepared background papers presented at a seminar hosted by DoD on July 9

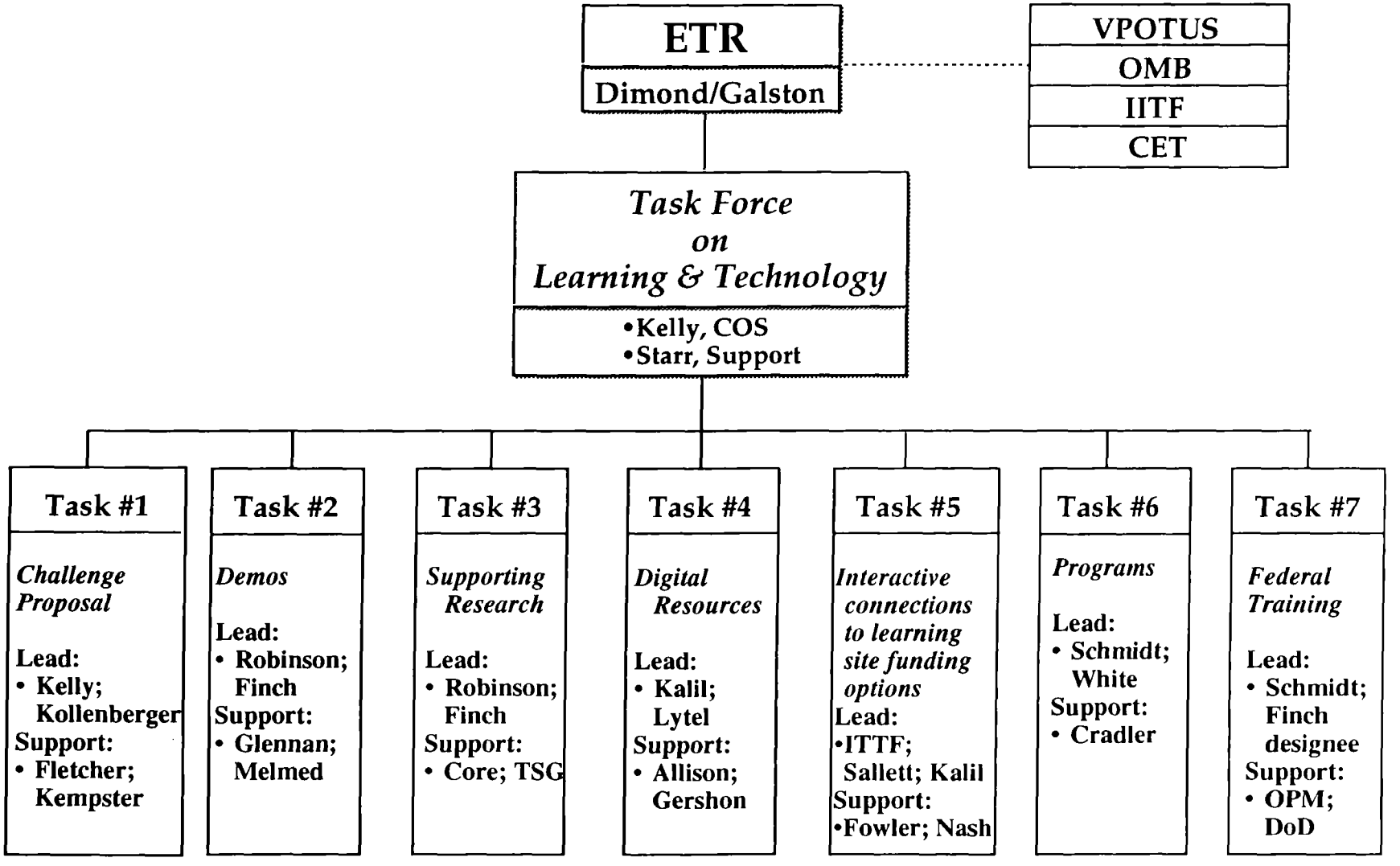
July 11 memo from Galston, Sperling, Gibbons charts a fast-track process to convert the background papers into specific proposals and decisions documents

- Coordinate agency submissions for FY96 budgets to develop the potential of interactive learning technologies
- Coordinate management of programs in FY95 to exploit potential of interactive learning technologies within current constraints

This meeting is designed to follow-up on the July 11 memo by initiating the preparation of a series of decision documents. For each project, we will be discussing:

- mission
- deliverables
- timelines

Task Force on Learning & Technology
Organization



Task Force on Learning & Technology
#1 Technology and Learning Challenge (TLC) Proposal

Lead: Kelly; Kollenberger

Support Team: Fletcher (IDA)
Kempster (TET)

Tasks: Design TLC challenge grant for submission as part of the FY96 budget

Deliverables: Draft of the TLC challenge grant RFP including:

I. **Challenge options (Due 1 Aug)**

a. objectives/vision
b. define learning content, curriculum that will become focus of TLC
c. define learning community that will apply for TLC, develop and use interactive learning technologies
d. description of exemplar projects
e. eligibility criteria
f. selection criteria
g. funding options : size and number of grants

II. **Management options (Due 5 Aug)**

III. **Final options and recommendations on TLC (Due 8 Aug)**

Task Force on Learning & Technology
#2 Demonstrations

Lead:		Robinson/Finch
Support Team:		Glennan/Melmed (RAND)
Tasks:		Define specific scalable demonstration projects possible within FY95 and FY96 funding and authority. The demonstrations would be targeted in several key learning markets (eg. pre-K-12, school-to-work, incumbent worker training, reemployment training) and would aim to stretch the state-of-the-art in instructional design and help define research needs
Deliverable:		A decision document covering options in the following areas:
	a.	Number and definition of existing demonstration projects (DoDDS, ARPA, DoED, DoE, NSF, NASA, others)
	b.	Options for industry cost-sharing or cost-sharing with state/local/ regional institutions
	c.	Options for expansion of the program in FY96 and/or inclusion in the TLC
	d.	Management options
	e.	Cost estimates and indication of available agency funding in FY95
	f.	Recommendations for funding in FY96
Due:		8 Aug

Task Force on Learning & Technology
#3 Supporting Research

Lead: Robinson/Finch

Support Team: Core/TSG

Tasks: Develop options that support research in software, pedagogy, evaluation, and other topics that will benefit a broad range of development for education and training

Deliverable: Recommend a FY96 R&D Agenda to NSTC, CET that includes options for integration of FY95 programs. Options should include specific tasks. Topics should include:

a. Software tools and simulated environments for teaching, life long learning, curriculum development, assessment, and self-directed exploration

b. Research on technology-based instruction that encompasses complex content for the 21st century

c. Technology based models and systems that are:

-Sustainable -Adaptable

-Scalable -Accessible and ubiquitous

d. Management options for program execution

Due: 8 Aug

Task Force on Learning & Technology
#4 Digital Resources: Content Development

Lead: Kalil/Lytel

Support Team: Allison (SI), Gershon (MITRE)

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

Deliverables: A decision document covering options in the following areas: Actions possible under funding available in FY95; specific options for expansion in FY96 (include options for institutions mentioned and for the Libraries program in OERI, NIH, and others as relevant):

a. Technical data in major R&D institutions in NASA, NOAA, USGS, HHS, USDA, others

b. Cultural data in Smithsonian, National Park Service, National Archives, others

c. Cost-sharing with private firms or donor organizations

d. International collaborative activities (GII)

how to get to data that is already there - how to browse / navigate

Due: 15 Aug

Task Force on Learning & Technology

#5 Competitive, Regulatory, and Public-Private Partnerships for Funding Interactive Hardware Connections to Learning Sites

Lead: IITF/Sallett/Kalil

Support Team: Nash (IDA), Fowler (MITRE)

Tasks: Define options for use of new regulatory authority, competition, and public-private partnerships to finance access to the NII for learning institutions of all kinds.

Deliverables: A decision document covering options in the following areas:

a. Options available to the FCC, state regulatory authorities, and governors under the new telecom legislation

b. Options for helping states develop model practices from business and technical specialists

c. Options to promote competition that will speed interactive connections to learning sites

Due: 4 Nov

Task Force on Learning & Technology
#6 Use of Technology in Major Federal Programs

Leads: Schmidt/White

Support Teams: Cradler

Tasks:

Define how learning technologies can be used to improve the effectiveness of the program

Ensure that the program makes efficient use of technological expertise available in other federal programs

Stimulate innovation and growth in firms supplying learning technology products and services under the program

Deliverables: For each program area:

a. A brief description suggesting how learning technologies could further the mission of the program during the next 5 plus years

b. Specific actions possible in FY95 for accelerating use of innovative learning technologies using existing authority and funding. These would involve changes in program management possible under existing authority

c. Options for FY96 requests

d. New legislative authority needed to ensure effective use of emerging information technology

Due: 4 Nov

Task Force on Learning & Technology
#6 Use of Technology in Major Federal Programs (con't)

Programs targeted for detailed examination:

Program	Agency	Individual (proposed)
Head Start	HHS	Olivia Golden •Linda Bowen •Helen Walsh •Dolly Wolverton
Job Corps	DoL	Peter Roll
One-Stops	DoL	Jim Volman-LMI
School-to-Work and Perkins Vocational-Ed/Adult education	ED DoL	Gussi Kappner Trish McNeil Denis Lieberman
Chapter 1	ED	Mary Jean Latendral Tom Payzant
Eisenhower Professional Development	ED	Alicia Coro Eve Bither OERI

Task Force on Learning & Technology
#7 Federal Training

Lead: Schmidt/Finch designee

Support Team: OPM/DoD

Tasks:

Use technology to improve the productivity of federal defense and non-defense training

Use federal procurement practices to stimulate innovation and growth in firms supplying training to the federal government with the aim of accelerating introduction of innovative practices in non-federal markets

Deliverables: A decision document covering options in the following areas:

a. Accelerated use of innovative learning technologies in non-defense agencies (set-asides, expanded program office, distributed learning/home learning) with FY95 funding and authority

b. MOU between defense and non-defense training organizations linking procurements, evaluations, and research activities

c. Dual use strategies explicitly defining how federal procurement can stimulate business aimed at non-government markets

d. FY96 budget options and/or need for new authority

e. Guidelines for procurement of training materials and devices

Due: 4 Nov

Task Force on Learning & Technology
Outreach

Lead:	Kollenberger/Fitzsimmons
Support Team:	O'Connor (MITRE)
Tasks:	Contact key stakeholders and potential collaborators in education, training, and state/local government to identify programmatic needs. Business interests would include communication, entertainment, software publishing as well as business organizations with broad interests in improving the quality of US education
Deliverable:	Hold a series of focused workshops and seminars aimed at identifying the barriers to expansion of learning technology in different markets
Due:	Nov 4

Task Force on Learning & Technology
Market Analysis

Lead: Hughes/Roberts

Support Team: TBD

Tasks: Conduct a survey of businesses to determine current and potential markets for developing and investing in the productivity of learning

Deliverable: Gather key information on sales trends, employment, and other data in the following areas:

a. Educational software sales to schools, universities and other education/ training institutions, home markets.

b. Computer and other information-related hardware sales to schools and other instructional institutions

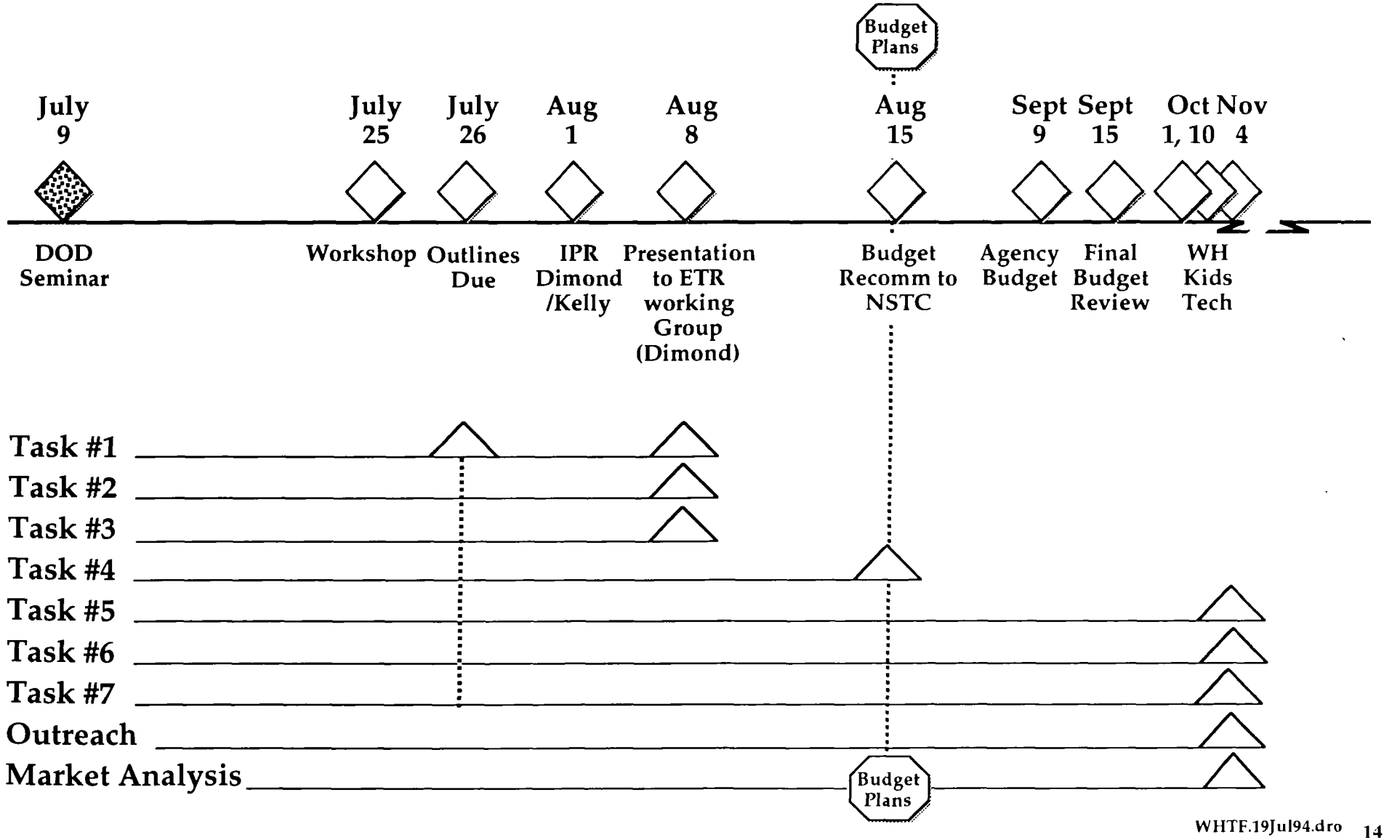
c. Computer games sales (hardware and software)

d. Video games sales (hardware and software)

e. Forecast introduction of mass-produced equipment with advanced capabilities (including new-generation video-games, high-defintion TV, next-generaton personal computers & peripherals)

Due: 4 Nov

Support Team Task for:
Task Force on Learning & Technology



Can Technology Support a Jump in

Learning Productivity?

Application of several technologies, when taken together, have the potential to promote a revolution in learning productivity -- the rate of learning, the access to learning, and the enjoyment of learning. The discussion and charts below illustrate this.

Rate of Learning

Research shows that tutoring provides learning at a much faster rate than class room instruction. Figure 1 illustrates this point. It shows the mean and distribution of students for learning rates for two populations -- those learning in the class room, and those learning from tutors. The tutored learning distribution is two standard deviations to the right of class room learning.

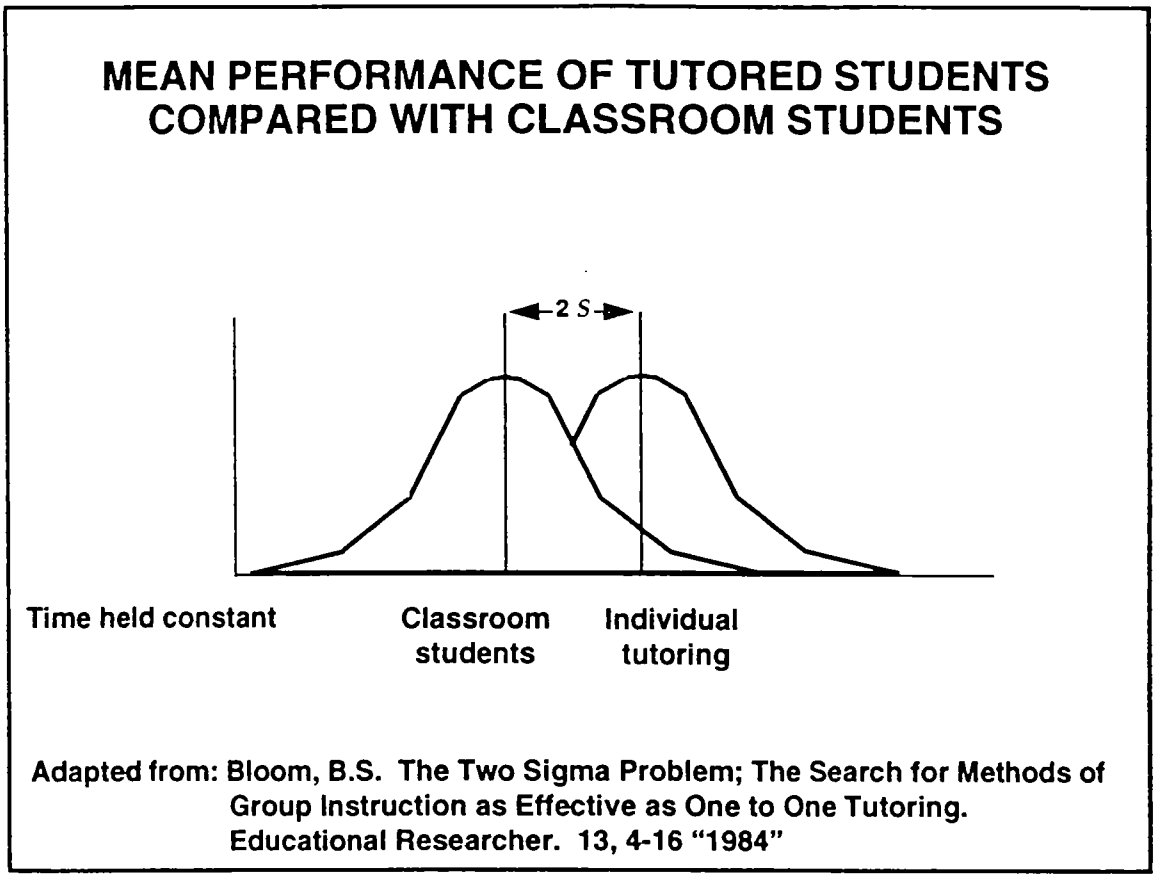


Figure 1

This figure shows that tutoring is a very powerful instrument for learning productivity. It is, however, impractical to use widespread tutoring as a device to reach vast portions of the population. An alternative, however, is the application

of interactive computer courseware. This software replicates at least some of the attributes of tutoring. It allows students to some degree to learn at their own pace, to follow their own exploration of the subject, and to learn in a way more compatible with their individual mental processes. To this point, such interactive courseware has achieved about a one standard deviation improvement over class room instruction. While not matching tutoring, this is still a huge increase in learning rate, and much more practical in terms of widespread application. Further, continuing research is attempting to find even greater gains in this application of technologies to learning rates.

Access to Learning

The National Information Infrastructure (NII) -- the Information Superhighway -- makes possible near universal access to high productivity learning software, including that discussed above. In principle, such software can be sent on demand to any home or workplace with work station consisting of a personal computer with a modem connecting it to the Internet or follow-on infrastructures. If such work stations were to be proliferated throughout society, then everyone throughout the various social and economic strata could have access to the same high powered learning technology that otherwise would be available primarily to the elite.

Figure 2 illustrates this point. It is a notional chart not based on actual data, but

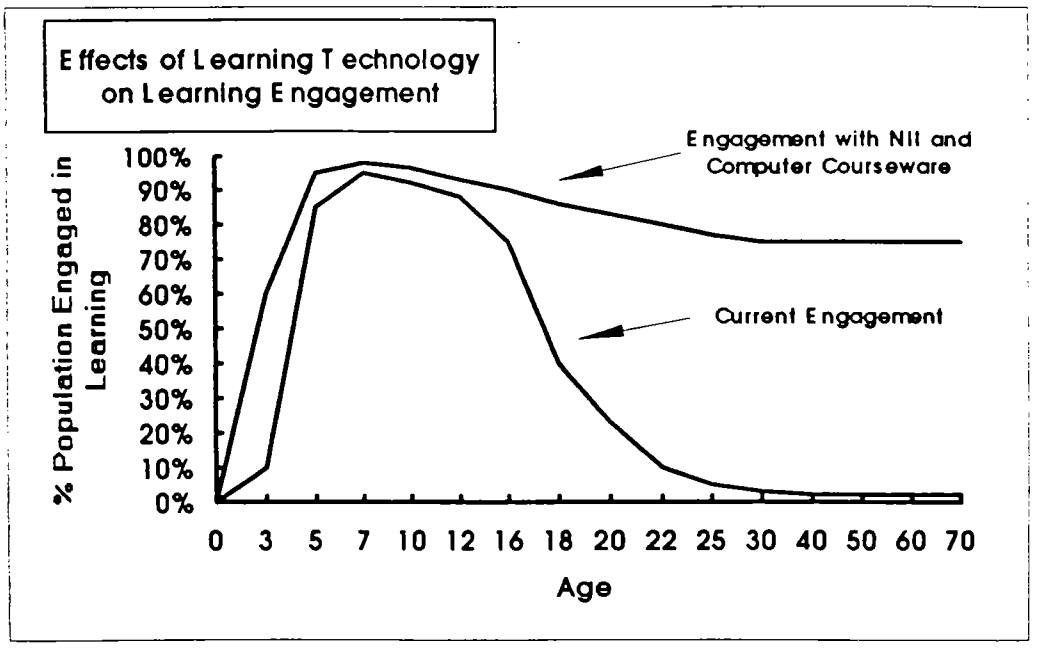


Figure 2

the general character of its curves are probably correct. The figure shows the percent of the US population engaged in learning as a function of their age. Currently there is a steep rise in learning engagement at about age 5 that probably begins tailing off at middle school, falls sharply after high school and may virtually stop after those in graduate school complete their work. With universal

access afforded by the NII, the percentages of those engaged in learning could be higher throughout -- especially for the later years.

This increased access could have particularly profound implications for those that are socially, economically or physically disadvantaged. Figure 3 shows what this effect might be. It illustrates that there is probably a large gap in learning engagement between those in poverty and the economic elite in our society. If, however, easy-to-use, effective, entertaining, inexpensive learning software were available via the NII, the poverty segment of the population would have at least the opportunity to learn at a high rate both the basic skills of a good education, and specialized job skills needed for productive employment.[1]

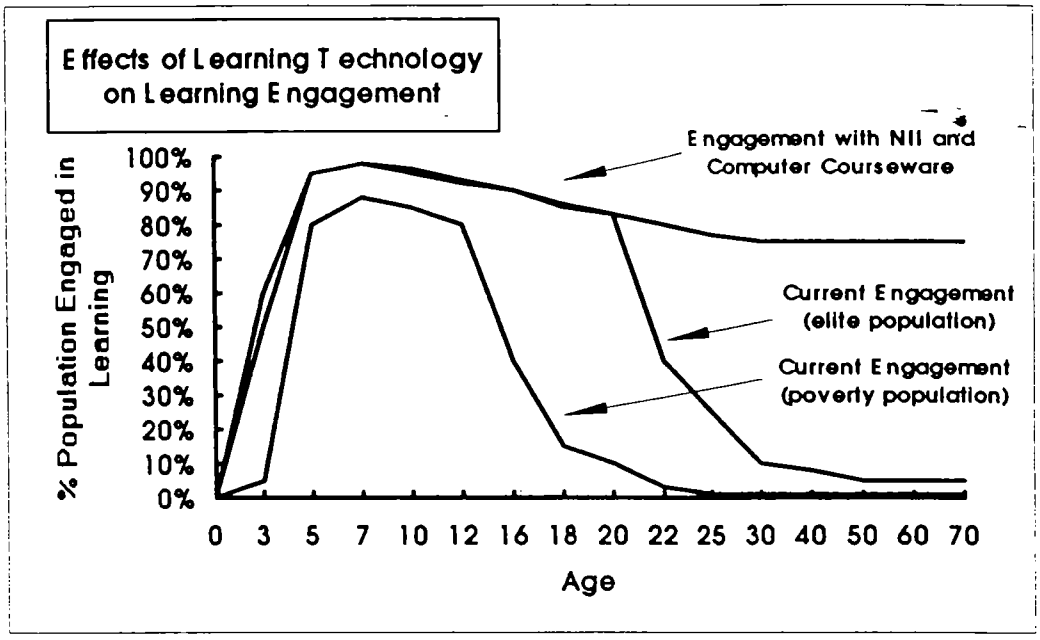


Figure 3

Enjoyment of Learning

Most of American youth -- and adults for that matter -- find more fun in playing video games or watching TV than engaging in class room learning. There exist, however, examples of computerized interactive courseware that teach basic educational skills -- math, reading, grammar, etc. -- using a video game format. This courseware seems anecdotally competitive in viewer interest with commercial TV and video games. It is possible that, if access to such courseware were near

[1] Note that the NII might have several added purposes related to productive employment. These include: 1) Opportunities to work at home for those like welfare mothers and the physically disadvantaged that can not travel to a work place; 2) A means of long distance testing of work skills as a means for employers to screen potential hires; and 3) A mechanism to marry job supply and demand through a national job bank that will show job seekers where the opportunities lie, and government officials information to help target training for skills where there's a demand.

universal, learning patterns and the use of Americans' free time could be changed substantially.

Figure 4 illustrates this point. The data on the charts is notional, but probably is a reasonable representation of reality. The stacked bar on the left shows the average distribution of time for children in school. A very substantial portion is devoted to TV and other activities that are of the pure entertainment variety. If, however, there was universal access to learning software that was fun to use, it is possible to imagine the time distribution shown in the stacked bar at the right. This would include a significant portion of children's' time being spent on "edutainment" – fun and productive learning. A similar redistribution could also apply to adults.

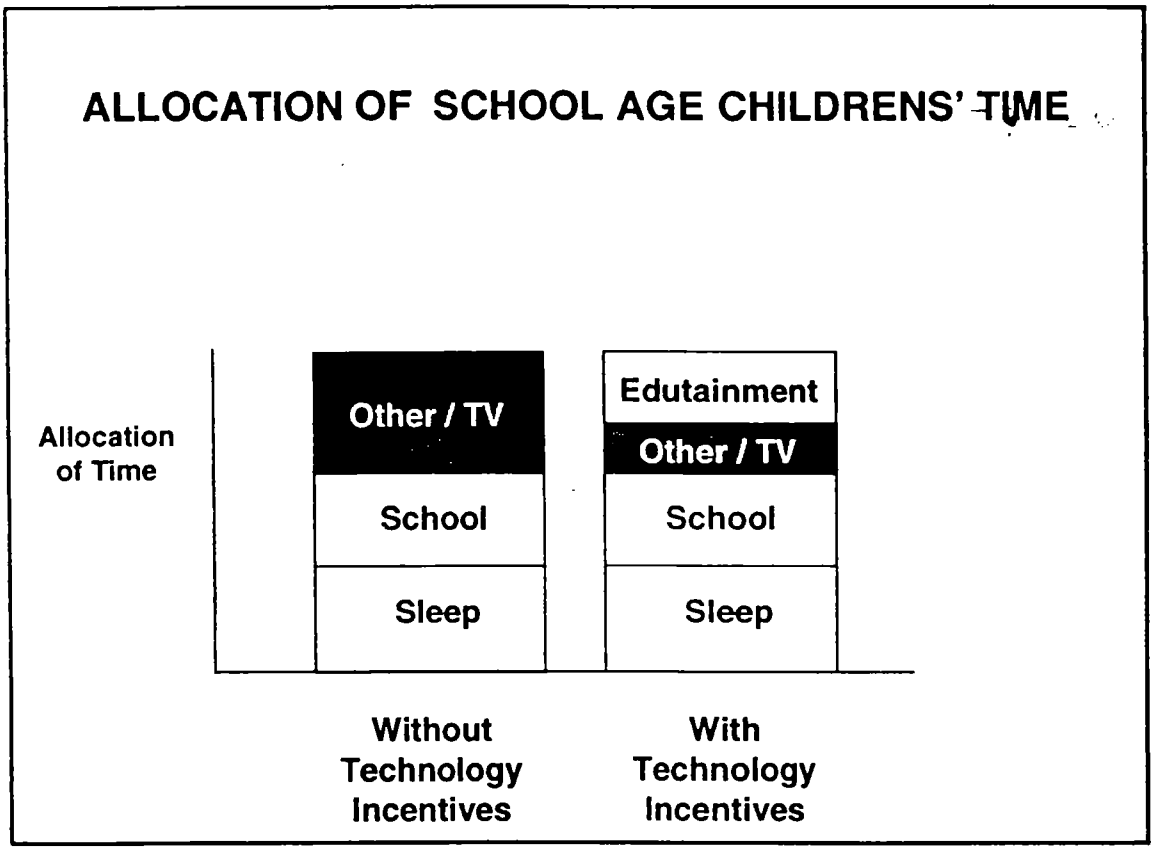


Figure 4

If learning software could be designed to compete effectively with purer forms of entertainment, the reallocation of the nation's time for learning would seem to produce a generally better educated public with much better skills for higher paying, internationally competitive jobs. If the entertainment content of such software were directed at economically disadvantaged portions of the population (as Sesame Street was for TV audiences), then it could afford a means of closing the learning gap -- and thus the earning gap -- among the economic strata in American society.

ETR/DOP Tasks 5-13-04

~~Stacy~~ ... half-empty-half-full thing going on here
~~Stacy~~
~~Stacy~~

(1) ↘ Fax back in advance, specific tasks, time frames, who involved.

- What outcomes?
- What actions?
- What do we want to see as an end product

Separate Process

(2) ↘ Challenge -- NII link -- Human Face.
What's the "big idea?"

↘ Process to meet w/ CEO's / Business involved in this staff.

Get 5 people in Hne.

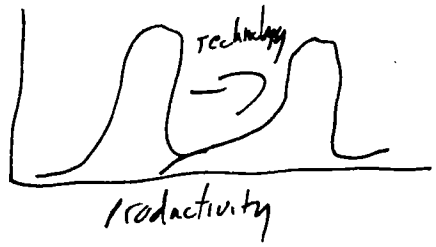
DoD Seminar Mtg 5-4

- Anita Jones is supportive, but probably won't play large role.
  - emphasize areas of tech that are already up & running -- not future projects

Paul - 3 areas
① what can we learn from DoD experience
② In DoD procurement, as move more toward tech, have opp to
③ In dual use area, this should be priority

↓ Tiger team to figure out what other agencies can do in their procurements

Agenda overview



Reilly - pose the problem -- importance of learning -- big picture
- Reich
- Brown - implementation from gov/industry
- Penttila - here's what we have available -- demo

need to tap supply and demand side of problem

Virtual Teams (ad-hoc, as-needed)

↳ post-meeting Demonstration in more depth?

↳ in show-and-tell -- more tell, less show -- explain how the military has solved some of these problems --
(the how & why, not the what)
- numbers of people trained, characteristics of trainees,

① what are DoD capabilities that others don't have
② what have they done/learned from ~~exper~~ capabilities
③ what are constraints to dissemination
④ what can we do about it

How do we push the envelope out (rin)
How do we catch-up with DoD (ram)

DOJ - DoD MOU signed to share ugd training for FBI, Local Law enforcement & Fire ~~fighters~~ fighters

---

Tiger teams

① short-term action: Action plan
- possible leg action, reg action, etc.

Sheila Robinson DoEd - OERI (Smith)

- Finch, Donahue - coordinate who's on Procurement Group
- Kelly - coordinate research

Kalil, Schmidt. coordinate VII, new markets group

Kent Hughes also

THE WHITE HOUSE

WASHINGTON

April 29, 1994

MEMORANDUM FOR GARY BOYCAN

FROM: PAUL DIMOND

SUBJECT: LEARNING PRODUCTIVITY SESSION

Thanks for your continuing help and patience: enclosed is a draft transmittal memo and agenda for review by you and Lou Finch. Let's plan to discuss this early next week with the key staff contacts at the other agencies so that we can finalize and distribute to the Secretaries by our next ETR meeting Thursday night.

As you will see, the draft agenda focusses on the issue of improving the productivity of learning. Based on my discussion with Tom Glynn on Thursday, we agreed that it made sense to put the DoL-DoD work on defense conversion/dislocated workers, management of training for incumbent workers, and the impact of defense downsizing on the youth labor market on a separate track. Tom will take the lead on these directly with Undersecretary Deutsch and your staff; as work materials or session proceed, you can share them directly with the relevant players at the other agencies and the DPC-NEC. I'll be glad to assist in whatever way that I can.

cc Bill Galston
Tom Glynn

April 29, 1994

MEMORANDUM FOR (Distribution List Attached)

FROM: Bill Galston, Deputy Assistant to the President for Domestic Policy

Paul Dimond, Special Assistant to the President for Domestic Policy

SUBJECT: ETR Seminar on Improving the Productivity of Learning

The Education, Training, and Reemployment (ETR) Policy Working Group would like to invite you to participate in a seminar on improving the productivity of learning. The seminar will be action-oriented and hands-on, and will explore the types of learning technologies developed by the Department of Defense that can be transferred to the civilian education and training sector. Our intent is to begin to look together at programs and strategies for accelerating the development and adoption of technologies that can achieve a major leap in the productivity and fun of learning in order to: (1) make it easier to reach the ambitious objectives set by Goals 2000, School-to-Work, and other Administration workforce policies; (2) provide major business opportunities in a rapidly growing field in which U.S. producers are clear international leaders; (3) create a key opportunity for Dual Use by the Defense Department that could increase the quality and reduce the cost of defense training; (4) transform educational and training institutions into high-performance workplaces, and; (5) meet a key objective of the National Information Infrastructure program.

This memorandum will briefly outline what we think this seminar will look like. As always, we welcome your ideas and suggestions -- Lou Finch (title here?) will be contacting your office early next week to discuss dates and times for the event and will be happy to discuss any questions or concerns that you may have.

Background

In the past half century, the Department of Defense (DoD) has invested substantial amounts of money, energy, time, and thought to improve the skills and readiness of the armed forces. This investment has involved both the training process and its applications to learners of different backgrounds and ability levels. Technology has been key to this process, and is becoming even more essential.

DoD has thereby learned a great deal in this area about what works and what doesn't.

The investments that DoD has made in this area are many, and cover a number of areas, including:

- Active learning from a distance through interactive networks;
- Portable learning that is available to personnel in classrooms, workplaces, and homes;
- Simulation technology to replace expensive, environmentally harmful, and/or dangerous learning experiences;
- Embedded instructional sequences in operational equipment.

This DoD investment can now be leveraged to enhance the productivity of learning in other sectors of the economy. The ETR Seminar on Improving the Productivity of Learning will concentrate on the types of learning technologies developed by DoD and their applications to civilian education and training. Other issues that have arisen -- such as lifelong learning in DoD, post-military employment history and military training contributions to the workforce, and employment opportunities for minorities and women -- could be presented as background material in this seminar.

Draft Agenda

A draft outline for the seminar has emerged based on meetings between the White House and key agencies participating in the event:

I. Introduction and Welcome -- DoD

II. Overview -- DoL

- Secretary Reich will give an overview of key workforce initiatives and opportunities for applying new technologies to improve learning productivity.

III. Overview -- DoEd

- Secretary Riley will give an overview of technology implications and issues involved in implementing Goals 2000.

IV. Overview -- DoC

- The Department of Commerce will give an overview of business development issues in the education and training technology industry, and discuss ways in which, through regulations and incentives, the National Information Infrastructure (NII) could be used to provide universal access to businesses, schools, and homes (we are still discussing the exact subject of this overview and who will present it with Kent Hughes, DoC).

V. Improving the Productivity of Learning -- DoD

- DoD will discuss their experience with leveraging technology for learning.

VI. Interactive Learning Technology Demonstrations -- DoD

VII. Vision and Action Plan For Improving Learning Productivity -- TBD

- Outline possible future actions, including establishing interagency "tiger teams" to develop plans of action in a number of related areas. Possibilities include:

  -- using federal procurement to stimulate early markets for innovative learning technologies;

  -- formation of public/private research and development consortia to develop new learning technologies;

  -- use of the NII to provide incentives for learning technology and to ensure universal access;

  -- promoting new businesses and opening new markets in learning technology, and;

  -- using federal program funds (Goals 2000, School to Work, etc.) to leverage the development and utilization of learning technologies.

Logistics and Follow-up

This Seminar will require a block of three-to-four hours that could be set aside at the Institute for Defense Analyses Demonstration Facility. This should allow enough time for discussion, demonstration, and active hands-on simulation. Several options are available to us as to the timing of the event, including holding it on a Saturday morning or afternoon, or on a weekday evening. As was mentioned earlier, Lou Finch will be calling your office to discuss these issues.

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here's what we're doing to implement

IV. Overview -- DoC

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- Outline possible future actions, including establishing interagency "tiger teams" to develop plans of action in a number of related areas. Possibilities include:

  -- using federal procurement to stimulate early markets for innovative learning technologies; - OPM, GSA,

  ATP TRP USF DOE NASA -- formation of public/private research and development consortia to develop new learning technologies;

  DoD, DOL, DoEd "leveraging demand side" -- use of the NII to provide incentives for learning technology and to ensure universal access; DOC FCC

  promoting new businesses and opening new markets in learning technology, and; Kalil Schmidt

  -- using federal program funds (Goals 2000, School to Work, etc.) to leverage the development and utilization of learning technologies.

5 - 3857

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DOD Event Mtg 5-10

- MOU's are done deal?
- Press Statement?
- Presidential Challenge?

---

edtech ~~NII~~ Budget FY95

① $50 millim in Ed Budget

② NTIA Admin Program - DOC
Telecom Info Infra
$26 millim grant Program.
already 8,000 requests
($100 request)

③ Telecom Comm Act - NII - on Hill now

④ Natl Electronics Init.?

⑤ High Perf Computing Init $1 billion
↳ schools use of supercomputer
↳ digital libraries (ARPA, NASA, NSF)

⑥ Nat Science Tech Council
CET

⑦ ARPA, ATP

Reed Hunt - FCC - Make presentation?
what FCC can do as part of making
connections with schools as part of def of universal access.

Ron Brown
- Chair IITF (Info Infra Task force)
- Trying to get together with his colleagues on this for some time

~~Professional Development of Teachers~~
~~How does actual connection to classroom happen. How to pay for?~~
- Looking at content ~~is not our role~~?
  ① provide good multi media info
  ② market for new info tech
- R & D -- ① authoring tools
  ② tech to help ↓ cost of connection (wireless)
  ③ Info appliances used to info to IT
- Look at how our programs affect markets.
- Looking at FY97 appropriations? What do we want from FY96

- What has Defense developed that is useful?
- Facilities: supercomp, scientific instruments

Partnerships w States

- Kumin – CBT – looking at R&D spending in Fed Govt?
- UI – should be minuted, be updated

Invite Reid Hunt

April 28, 1994

MEMORANDUM FOR (Dist Attached)
Galston

FROM: Paul Dimond

SUBJECT: ETR Seminar on Improving the Productivity of Learning

In the past half century, the Department of Defense (DoD) has invested substantial amounts of money, energy, time, and thought to improve the skills and readiness of the armed forces. This investment has involved both the training process and its applications to learners of different backgrounds and ability levels. Technology has been key to this process, and is becoming even more essential. DoD has thereby learned a great deal about what works and what doesn't.

The investments that DoD has made in this area are many, and cover a number of areas, including:

- Active learning from a distance through interactive networks;
- Portable learning that is available to personnel in classrooms, workplaces, and homes;
- Simulation technology to replace expensive, environmentally harmful, and/or dangerous learning experiences;
- Embedded instructional sequences in operational equipment.

This DoD investment can now be leveraged to enhance the productivity of learning in other sectors of the economy. The ETR Seminar on Improving the Productivity of Learning will concentrate on the types of learning technologies developed by DoD and their applications to civilian education and training. Other issues that have arisen -- such as lifelong learning in DoD, post-military employment history and military training contributions to the workforce, and employment opportunities for minorities and women -- could be presented as background material in this seminar. Lou Finch will be in touch to set up a time

A draft outline for the seminar has emerged based on meetings between the White House and key agencies participating in the event:

Draft Agenda:

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II. Overview -- DoL

- Secretary Reich will give an overview of key workforce initiatives and opportunities for applying new technologies to improve learning productivity.

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IV. Overview -- DoC

- Secretary Brown will give an overview of business development issues in the education and training technology industry, and discuss ways in which the public and private sectors can interact and cooperate in this area.

V. Improving the Productivity of Learning -- DoD

- DoD will discuss their experience with leveraging technology for learning.

VI. Interactive Learning Technology Demonstrations -- DoD

VII. Vision For Improving Learning Productivity -- TBD

- Outline possible future actions, including establishing interagency "tiger teams" to develop plans of action in a number of related areas, including: (list here?)

This Seminar will require a block of three-to-four hours that could be set aside at the Institute for Defense Analyses Demonstration Facility. This should allow enough time for discussion, demonstration, and active hands-on simulation. Several options are available to us as to the timing of the event, including holding it on a Saturday morning or afternoon, or on a weekday evening.

move up front

- Interactive learning technology demonstrations. Action: DoD.
- ~~Policies~~ improving learning productivity. Action: (TBD).

Discussion of options for improving by encouraging Tech Transfer

The purpose of this seminar

~~OSTP and NEC recommended that this seminar~~ concentrate on technology and its applications to civilian education and training. Other issues that have arisen -- such as lifelong learning in DoD, post-military employment history and military training contributions to the workforce, and employment opportunities for minorities and women -- could be presented as background material in this seminar.

Possible future actions would include establishing an interagency "tiger team" to develop a plan of action that would provide the following:

- A shared vision for the application of technology to improve the productivity of learning.
- Identify Barriers to Transfer of DoD Learning tech to civ sector creating strategy for overcoming barriers
- A strategy for mobilizing R&D resources of the agencies to develop learning content.
- Collaborative research and development work plans.
- Plans for new legislation.
- Demonstrations of learning technology as an essential multiplier in the administration's legislative initiatives such as the School to Work Opportunities Act and the Goals 2000 Act.

This seminar will require a block of three-to-four hours that could be set aside at the Institute for Defense Analyses Demonstration Facility. This should allow enough time for discussion, demonstration, and active simulation.

A Saturday morning may be the best time. We should plan on about 20-30 participants from the White House and the agencies.

- may not be best time for Sec ~~Defty~~ Rech

April 25, 1994

MEMORANDUM FOR PAUL DIMOND AND MIKE SCHMIDT

FROM: Henry Kelly, OSTP

Subject: Draft Zero Of Overview Piece For Our Learning Levers Summit

This is a first cut at providing context for our learning initiatives. I haven't recieved anything from Mike Smith yet so it's light on education material. I also have not discussed many specifics of the potential initiative (including the business links we talked about on the white-board). We need to have a brief schmooze later today. Give me a call.

The Challenge

The American economy is going through changes likely to redefine every American business and every American job several times during the coming decades. Competitive advantage will be based not so much on price as on an ability to get high-quality, innovative products to the market quickly and to tailor them efficiently to the needs of small markets or individuals. This change requires a workforce with increasingly sophisticated technical and communication skills and reduced demand for people trained only for routine physical or clerical tasks. Emerging technology will steadily substitute automation for predictable tasks placing a premium on talents such as caring, planning, adapting, and hustling.

Job markets are therefore likely to place great demand on such things as talent for learning new tasks quickly, knowing where to look for help when information is incomplete, and an ability to adapt to teams built from people with many different backgrounds -- in short an ability to cope successfully with change. These are also the talents required by troops in today's US military force -- one prepared to move quickly into unfamiliar environments in actions against opponents with widely varying capabilities and tactics.

The Response

Recognizing that rapid economic change is inevitable, the administration has adopted a number of programs centered around the theme of "making change our friend." If we're going for a wild ride we want to be on top of the tiger, not in it.

Administration programs have been built around the following themes:

1. Encouraging innovation and adaptability in American businesses both by creating a favorable domestic and international climate for US investment and risk-taking, and by directly supporting the development of productive new technologies. Federal programs rest increasingly on cooperative, cost-shared development programs combining federal and private funds.

2. Encouraging the Department of Defense to shift away from a "defense industrial base" using defense research and procurement programs to create strength in civilian production wherever possible. It is no longer possible for the Defense department to develop many advanced technologies for its own use and this "dual use" strategy will ensure that our armed services have access to state-of-the-art products at the lowest possible price.

3. Crafting an approach to education and training policy built around radically new demands being placed on US workers. The programs are designed to: (i) providing access to learning throughout a person's career, (ii) removing barriers and risks that impede job mobility and career flexibility (early childhood programs, portable health

benefits, qualifications, and pensions and on assistance in career planing and job hunting, and (iii) encouraging investment in techniques that can increase the productivity of learning -- something that requires an ability to adapt learning environments to the specific needs of individuals.

Workforce Policy

The Administration's workforce policy has been built around are embodied in the School-to-work Opportunities Act of 1993, the Reemployment Act of 1994, the Goals 2000 Educate America Act of 1994, National Service, and other programs. They are two important themes: (i) creating a system where the market for skills and the acquisition of skills operates more efficiently, and (ii) providing resources to ensure that individuals have access to high-quality training and remployment services. The programs are designed to empower individuals both by giving them the resources and the information needed to make wise investments in their own futures.

A. Information

Information is provided for workers, businesses, education and training institutions, and other key players through several key new programs:

- *Information about training and other program opportunities* will be provided through the new One Stop Career Centers. These centers provide easy access to employment, education and training information and services for anyone looking for help in finding a first job, a new job, or a better job. The centers will provide a single source of information about employment programs and provide customized screening and referrals.

- *information about job markets* will be provided through the National Labor Market Information System. This system will provide easy access to accurate, up-to-date information about the location of emerging jobs and the skills and experience needed. They will also provide assistance in job searches.

- *information about the quality of training services to provide accountability* will be provided through the Performance Accountably and Outcomes. This program will permit the development and of information about the quality and success of service areas, career centers and service providers, and other institutions offering training and other assistance.

- *information about the skill levels of individuals in the workforce* will be provided both through the standards achieved in the Goals 2000 program and through the establishment of voluntary skill standards. These standards will help industry, employers, unions, educators, government to recognize what needs to be achieved.

S. 600 - school-to-work

B. Resources

The administration made a major commitment to increased federal funding for education and training investments increasing funding by [30%?] between 1994 and 1995. The programs include:

- programs that permit students to enter school "ready to learn". These include Head Start, and increased support for vaccinations and WIC.
- Pell Grant Program
- creation of income contingent loans which will allow individuals to borrow against future earnings at any point in their careers.
- School-to-work development grants that will build on successful existing programs (youth apprenticeship, tech-prep education, cooperative education, career academies, school-to apprenticeship programs and others). The projects funded will include work-based learning, paid experience, and workplace instruction as well as instruction in general competencies consistent with the Goals 2000 program.
- continued support for professional training in NSF, NIH, and other programs

Next Steps

The Administration has clearly taken significant steps to ensure that education and training resources are available to all Americans and that markets for education and training operate efficiently. It is time for the next step.

The systems used to provide education and training are themselves being reshaped by the same forces that are reshaping the rest of the economy. Like other institutions, they must be prepared to embrace change and use new technologies to serve the needs of individuals efficiently and flexibly. They must themselves become "high performance work places" allowing their employees to grow and change with the institutions.

Governments have an enormous influence over traditional education enterprises and therefore has a unique responsibility to use its influence to encourage change. To date its influence has been in precisely the opposite direction -- inadvertently discouraging the kinds of innovation that have redefined most other information-intensive enterprises in the nation. Teaching institutions grossly under invest in research and development, they have extraordinarily low capital investments per employee, and have few incentives to achieve improvements in productivity.

The major exception to this is the Department of Defense. Free of the ordinary constraints of formal education and training institutions, DoD has invested heavily in

research and development that has led to revolutionary changes in the way training is delivered and the way the results of training are measured.

The single most difficult barrier to innovation in learning is the fact that most thinking about improvements in learning is Arcadian and not utopian. The first step in a revolution is acknowledging that progress is possible. And DoD has done just that. It has consistently proven that the productivity of training can be increased by at least 30% making use of comparatively simple instructional technology.

- **Technology can bring learning to people instead of forcing people to come to learning institutions.** The National Information Infrastructure can provide seamless access to enormously rich resources of information at home and on the job. The NII will make it possible for people to learn whenever learning is convenient -- at home, after work, during slack periods at work, at libraries, community centers, armories, walk-in facilities in Malls. This is extremely important for people who must combine learning with complex, increasingly frantic lives such as single mothers, people working multiple jobs, people caring for elderly parents at home. Technology can make compelling learning environments available to students and workers during the 60-80% of their day that they are not formally in school or on the job.

- **Learning will be delivered by an increasingly diverse set of institutions.** While formal schools, universities, and training institutions will continue, new technologies and new learning needs will spawn diverse new enterprises. These will include communication and entertainment companies interested in exploiting the potential of the new NII, innovative publishers and software houses interested in selling products to anyone who will buy (schools, homes, businesses), and firms integrating instructional systems into their products. New software and hardware systems delivered to firms are likely to be more attractive if they are easy to learn. Indeed training systems may be embedded in the systems themselves -- e.g. the new systems may teach new operators how to use them and provide built-in tutorials and guides for emergency assistance.

- **Learning will be focused on individuals and a premium placed on systems that can easily adapt to individual learning styles and the needs of small groups of learners.** Systems will need to react flexibly to the unique backgrounds and skills of the individuals using them. This means flexibility in content, style of presentation, preference for individual or group learning, and in the pace.

- **The occupations now associated with teaching and training will become much more diverse.** A successful transition to a new approach to learning will require close involvement of the people expected to deliver these new services. The professions of teacher and textbook writer will disappear into a complex set of occupations ranging from content experts to counselor and coach. All of them

must have a stake in seeing the new system deliver an increasingly productive, and flexible learning environment. In short, the institutions delivering services to learners must themselves become high-performance work environments.

- **The levels of skill demanded by learners will become more sophisticated and change rapidly; learning systems must be flexible and coninuously adapt.** The skills needed by the workforce will be diverse but virtually all will require a solid grasp of technical concepts and an ability to communicate clearly in many different media. The workforce will require highly specialized skills but many of these specialties will change rapidly requiring constant learning.

Programs

The programs most likely to accelerate development of new learning technologies are straightforward extensions of the principles already articulated by the administration in other areas:

1. Public/Private partnerships can be developed to accelerate development of innovative learning systems and the development of key learning resources.

2. The Department of Defense can move toward the dual use strategy of employing "best commercial practice" in procuring instructional systems. This means encouraging development in commercial instructional institutions and making extensive use of the emerging civilian NII for delivering services.

3. The new technologies can make it easier to meet Administration objectives in its workforce programs:

   - Programs designed to assure efficient markets for education and training should operated to ensure that successful innovations in learning are rewarded. Instructional projects should be evaluated in a way that measures the kinds of efficiencies made possible by the new technologies.

   - School-to-work programs should encourage systems which connect prospective employers to schools through information technologies. Computer simulations available in school or at home can provide experience with complex equipment that could not otherwise be purchased.

   - Simulations can test complex skills in ways that are convincing to the learner, the teaching or training institution, and prospective employers. A much wider range of skills can be demonstrated providing a rich way to present credentials.

   - The NII can provide powerful tools for gathering and disseminating information about instructional programs, jobs, and tutorials about job searches.

- The training the federal government procures for its own employees should reflect the state of the art in learning technology.

- Education and training can be tailored for the specific needs of minorities or people with handicaps

QOP Exec Mtg 4-26-94

- Paul Dimond meet w Glynn today
  - Admin outliers broad workforce Trainings Ed Themes
  - ~~POD~~
  - Reed Hundt to be invited - FCC chair should

meet TOMORROW

call Kent on DOC input

Timeframe - 3-4 weeks

Talmira Hill
401-3389
CTR Leg Group

call Kitty

memos
~~Bills~~ Paul -

griffin --
1:00

Leg affairs
Doug Sosnick

Kathy Hughes
219-1274

Public Liaison
integrated
- Elgie

Ann-Pac

25 April 1994

Memorandum for the Record
From: Gary Boycan
Subject: Improving the Productivity of Learning -- Next Steps

In the past half century, the DoD has invested substantial amounts of money, energy, time, and thought to improve the skills and readiness of the armed forces. This investment has involved both the training process and its applications to learners of different backgrounds and ability levels. Technology has also been key to the process and is becoming even more essential. DoD has thereby learned what works and what doesn't. These investments cover:

- Active learning from a distance through interactive networks.
- Portable learning that is available to personnel in classrooms, workplaces, and homes.
- Simulation technology to replace expensive, environmentally harmful, and/or dangerous learning experiences.
- Embedded instructional sequences in operational equipment.

This DoD investment can now be leveraged to enhance the productivity of learning in other sectors.

Based on meetings held over the past two weeks, input from NEC, and subsequent discussions with OSTP and DoL staff, the following has emerged as a preliminary outline for a seminar on the transfer of DoD technology to the civilian sector. These applications include first job (initial) training, new job (initial skill) training, and better job (re-) training.

Boycan/Fitzsimmons collaboration post-Glynn/Deutch meeting

- Introductory welcome. Action: DoD.
- Overview by Department of Labor of policies, issues, and available resources for improving learning productivity. Action: DoL. -Administration strategy -Broader Theme
- Overview by Department of Education of technology implications and issues in implementation of Goals 2000. Action: DoEd.

Brown Overview

- Improving the productivity of learning -- the DoD experience with leveraging technology for learning. Action: DoD.
- Business Development #1 Ed & Training Industry / Govt/Industry cooperation

- Interactive learning technology demonstrations. Action: DoD.

- Vision for improving learning productivity. Action: (TBD).

OSTP and NEC recommended that this seminar concentrate on technology and its applications to civilian education and training. Other issues that have arisen -- such as lifelong learning in DoD, post-military employment history and military training contributions to the workforce, and employment opportunities for minorities and women -- could be presented as background material in this seminar.

Possible future actions would include establishing an interagency "tiger team" to develop a plan of action that would provide the following:

- export (factor) issue → new markets for business development
- A shared vision for the application of technology to improve the productivity of learning.

- A strategy for mobilizing R&D resources of the agencies to develop learning content. not just standard govt research grants

- Collaborative research and development work plans.

- Plans for new legislation.

- Demonstrations of learning technology as an essential multiplier in the administration's legislative initiatives such as the School to Work Opportunities Act and the Goals 2000 Act.

- Procurement - a strategy for developing learning content thru procurement

This seminar will require a block of three-to-four hours that could be set aside at the Institute for Defense Analyses Demonstration Facility. This should allow enough time for discussion, demonstration, and active simulation.

A Saturday morning may be the best time. We should plan on about 20-30 participants from the White House and the agencies.

Learning Technology - A Vision For America

Computers and information technology have dramatically changed the way we conduct human affairs. The amount of information which can be generated, transmitted, processed, and stored is expanding exponentially. Our ability to instantly communicate information from point to point or around the globe is increasing at a similar rate. There are comparable revolutions in other areas of technology as well - - in physics, bio-technology, energy, and medicine. The rapid growth of these technologies will drive our work force to either adapt to change, or fall farther and farther behind.

The Office of Science and Technology has been leading the effort to develop a collective vision of the use of technology for life long learning. This vision statement is fairly simple, yet profound in it's implications. It is to ensure every American has personal access to learning any place and at any time.

A fundamental component of this vision is that each home, school, armory, library, and center of work will be a node on the national information infrastructure (NII). Access to information infrastructure should be universal and affordable for all Americans.

There will be a superabundance of interactive learning media, designed to meet specific learning objectives, in every domain of human knowledge. Use of the NII will enable life long learning and will dramatically increase our national productivity.

Learning Technology - A Vision For America

I am delighted to have the opportunity to speak with you today about improving national productivity through the use of education and training technology. As Dr. Jones has just demonstrated, DoD has played a leading role in developing advanced forms of learning technology to improve the readiness of our Armed Forces.

The scale of our efforts are enormous. We train well over a million active and reserve personnel per year at costs exceeding 15 billion dollars. DoD personnel are trained in the classroom, out in the field, and on-the-job, throughout their entire career. In the military, when you're not in combat, you are in training.

Formal training includes over 20,000 courses spanning the full range of basic and advanced technical skills. Many of these courses involve the use of advanced technologies such as computer-based training, teletraining, and distributed simulation. Much of what we have done - the courses, the technology, the standards, and the "know how" - are directly transferable to national education and training needs.

I'm here today to convey to you, that the Department of Defense is committed to supporting the Nation's Education and Training Goals. We have learned from previous World Wars that America's strength is not limited to it's military forces - It depends in large part upon the

productivity of it's industrial base, the competence of the nation's work force, and the innate intelligence and optimism of the American people.

I hope this meeting (today) will be the first step we take together to coordinate our plans and resources to meet our common goals.

As we contemplate our national goals at the close of the twentieth century, it may be appropriate to consider the pervasive role of technology in shaping the nature of American society.

Computers and information technology have dramatically changed the way we conduct human affairs. The amount of information which can be generated, transmitted, processed, and stored is expanding exponentially. Our ability to instantly communicate information from point to point or around the globe is increasing at a similar rate. There are comparable revolutions in other areas of technology as well - - in physics, bio-technology, energy, and medicine. The rapid growth of these technologies will drive our work force to either adapt to change, or fall farther and farther behind.

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There are several things we can do immediately.

The Defense Department has just established a program called "Troops to Teachers" which will help both military and civilian personnel who are leaving the Defense Department by supplementing the pool of teachers in public schools. This program is designed to help meet the Presidents National Education Goals by surveying the requirements of individual school districts, helping ex-DoD personnel to become certified to teach, and by funding up to 50% of their salary for the first five years.

DOD's Research Labs have developed numerous tools and techniques for developing computer-based training and simulations. Some of these programs are still in development and could be modified to meet dual use applications. We need to get our agencies together and crosswalk our R&D efforts in training technology to national needs.

The Department of Defense has extensive experience in the design and development of interactive training systems. Our instructional system developers have published a set of standard procedures for analyzing requirements, identifying learning objectives, designing delivery systems, developing courseware, and evaluating it's effectiveness. These procedures and expertise should be made available to other agencies.

There is a vast amount of public, commercial, and government developed educational materials which could be more effectively utilized. These materials should be identified, cataloged, assessed and where appropriate, converted to common formats that would permit wider access.

We can also initiate new programs to guide technology investments.

Our national research labs could be directed to design new learning tools, create new models and simulations to support educational needs, and evaluate the effectiveness of newly developed learning technologies.

An obvious target of opportunity is the development of affordable courseware to support recently adopted national learning objectives for K through 12. The development of a common set of authoring tools would greatly reduce the amount of time teachers spend developing curriculums. This courseware should be designed to be open architecture and non-proprietary, in order to ensure that it is portable, low cost, and that modifications can be made easily.

Teachers should have the capability to easily access illustrations, charts, and film clips from libraries around the country via the information super highway.

Concurrently, we should encourage entrepreneurs to develop educational games based on our new national learning objectives. Several good examples of "edu-tainment" programs, such as "Sim-Ant", and "Sim-Earth" are actively in use by children at home. Our schools should have similar programs to motivate children to learn in the classrooms.

To prime the pump, it may be appropriate to provide incentives for industry to develop these new interactive programs. After all, many business, both large and small, will share in the financial benefits of the information infrastructure.

It is also necessary to focus our efforts in training and retraining the adult population. Here again, we need standard sets of tools and systematic procedures to use in developing a wide variety of programs to support life long learning. Some of these same tools and programs could support "just in time" learning on the factory floor.

The nation should coordinate the development of expert systems and knowledge databases. These artificial intelligence tools could be based on individual experts in specific fields of knowledge, or they could be large integrated multimedia databases. These systems should be capable

of adapting to the learning level of the user and could be used as on-line expert tutors to support educational needs as well as on-the-job performance.

If we can agree today on the scope of this vision, I suggest we devise a common national strategy for leveraging technology to meet America's education and training needs.

To this end, I recommend that we establish a Tiger Team that would review existing plans and requirements, develop a Plan of Action and Milestones, and report back to us in 90 days. Pending approval of the plan, we can then assign specific agencies to take the lead on specific tasks.

DoL Comments - More focus on options for accelerating Transfer of Learning/Training Technology to Civilian sector.

25 April 1994

Memorandum for the Record
From: Gary Boycan
Subject: Improving the Productivity of Learning -- Next Steps

More Action oriented

In the past half century, the DoD has invested substantial amounts of money, energy, time, and thought to improve the skills and readiness of the armed forces. This investment has involved both the training process and its applications to learners of different backgrounds and ability levels. Technology has also been key to the process and is becoming even more essential. DoD has thereby learned what works and what doesn't. These investments cover:

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This DoD investment can now be leveraged to enhance the productivity of learning in other sectors.

Based on meetings held over the past two weeks, input from NEC, and subsequent discussions with OSTP and DoL staff, the following has emerged as a preliminary outline for a seminar on the transfer of DoD technology to the civilian sector. These applications include first job (initial) training, new job (initial skill) training, and better job (re-) training.

- Introductory welcome. Action: DoD. Key WF initiatives + IPP for applying new tech to improve learning prod
- Overview by Department of Labor of policies, issues, and available resources for improving learning productivity. Action: DoL.
- Overview by Department of Education of technology implications and issues in implementation of Goals 2000. Action: DoEd.
- Commerce overview here. - Business Development/Ed & Training Industry -- Public/Private Cooperation
- Improving the productivity of learning -- the DoD experience with leveraging technology for learning. Action: DoD.

THE WHITE HOUSE

WASHINGTON

April 14, 1994

MEMORANDUM FOR HENRY KELLY

FROM: PAUL DIMOND

SUBJECT: IMPROVING THE PRODUCTIVITY OF ~~LEARNING~~ -- Next Steps

1. **Plan Seminar at DOD for Secretaries/Principals.** There will be at least three or four parts to the seminar at DOD after the welcome by Deutsch:

- overview speech of policy/issues/available resources for improving learning productivity [by Reich?] -- Kelly draft
- Improving Productivity of Learning, the DOD Experience with leveraging captive time and technology (~~ending with a focus~~ on what we call content of learning to be played on networks) [by Anita Jones] -- Funk draft (include some interactive learning demos if at all possible. Henry, can we do this so all the participants can play the learning game?)
- vision for the future with improving learning productivity (ending with suggestion for Inter-Agency Tiger Teams to determine how to mobilize R&D resources/training procurement of agencies to develop learning content. May also want to discuss absolute foundation importance of connecting school/home/work on the network.)[by Deutsch] -- Finch draft
- ~~conclude with~~ Goals 2000 and learning productivity [by Reilly?] -- Mike Smith or ~~designee draft? [I'll call Mike on this. I think we need a Hosannah~~ from the Education Secretary here; and the deal on Goals 2000 with Sen. Bingaman is that in exchange for not earmarking or otherwise dictating technology component, Secretary will figure out how to make technology a big part of Goals 2000 implementation. This leaves the issue of roles for Secretaries Brown and Shalala in all of this....One way to handle is to have next meeting, to discuss reports of Tiger Teams, scheduled to be hosted by Commerce/ATP/NTIA...thoughts?]

If we can circulate these drafts on Monday April 25, that would be splendid. We can then meet with Jack Donohue (and Mike Smith or his designee) to finalize.

I think that we need a block of 3-4 hours for the seminar to permit enough time for discussion, demonstration, active simulation, discussion, etc. So, a Saturday morning may be the best bet... Thoughts? Plan on about 20-30 participants from White House and the Agencies.

2. **Overview Speech of Policy Issues** -- Kelly Draft. Main points:

- In the new economy, higher wages and higher returns go to higher skills; increasing

productivity (higher living standards) depend on improving skills of workforce; increasing opportunity and upward mobility (and overcoming overall wage stagnation and increasing inequality) depend on improving skills and networks of opportunity for all.

●That's what Goals 2000, School-to-work, Lifelong Learning/Income Contingent Loans, Reemployment Act are designed to do. [Left a little up in the air here is continuous learning that is an increasing part of most jobs and on-the-job training. If you need help on this, then please consult with Mike Scmidt in my absence; Mike works with Galston and me.] Discuss how these initiatives will work (1) in the environment of markets, information, accountability and benchmarks, income-contingent loan inspired choice, and regulation (2) with various providers of learning services and (3) with individuals, employers (private and government),etc. [Chart with how this will work, possible points of influence/intervention: Henry, this is what we began to map on the Whiteboard]

- what are training expenditures today?

● The challenge is that the productivity of learning hasn't been increasing very much, particularly compared with the productivity of many other industries, old and new. [Chart] Opportunities for improving learning include (a) leveraging learning at school (or at work) with time at home and (b) improving productivity of learning (because it's the learner who learns) through providing alternative pathways, learning in clusters (e.g., parents and children or peers), artificial tutors, coaches, etc. [Chart on raising base of learning through (a), slope of learning through (b)].

● In the past twenty years, the federal government has invested substantial amounts of money, energy, time and thought in improving the skills and productivity of the military workforce. [scale of $ amount in workforce training, including trends of learning on the job -- what is military preparedness if not constant training on the job --, providing active learning from a distance through interactive networks, making learning available to personnel during non-working hours in many environments]. We're here today to find out what DOD has learned about improving learning in these respects and to begin to understand whether there are ways that we can work together to apply what they have learned to improve learning in the civilian sector. [Statement about relevance to DOL mission?

3. **Outline Tiger Team Tasks** -- Henry Kelly and Mike Schmidt draft? If you two want to take a crack at this, more power to you: (1)stimulate R&D consortia to develop learning content/pathways through Agency RFPs (separate, joint, interagency oversight?) and (2)(a) stimulate development of learning content/pathways through procurement of federal training and (b) through federal education and training contracts/vouchers (e.g., Pell Grants/student loans/labor $ to consumers/information/regulation. Other Tiger Teams? Other tasks? See you on April 25. Bon Voyage!

cc Mike Schmidt

LINKING WORKFORCE POLICY, TECHNOLOGY, AND DOD

I. Overall Workforce Strategy (from Workforce Paper):

- Lifelong Learning
  - -- access to training and education throughout entire life
- Job Changing Tools
  - -- remove barriers and risks that impede job/career mobility and flexibility
- Competitive Companies and Good Jobs
  - -- promote the development and growth of new industries
  - -- promote innovative work practices and high performance workplaces

II. What Can Government Do to Help?

- Create Market Incentives for Innovations (need some help on this one)
- Giving People Ability to Access Training and Education Over Entire Lifetime (Lifelong Learning)
  - -- income contingent loans
  - -- Reemployment Act
  - -- Goals 2000 and School to Work
- Leveraging Private Resources
  - -- R&D spending
  - -- demonstration projects

III. How Does Technology Fit in to All of This?

- Increase Productivity of Learning
- Cost-Effectiveness
  - -- central libraries of information
- Increase Access to Learning
  - -- Information Superhighway allows easier access to information and learning
  - -- learning away from work & school (via information

networks , CD Rom, etc.)

IV. How Does DOD Fit in to All of This?

- DOD has experience in using technology to train large, widely-dispersed training populations -- we can learn from their experiences

- Technology Transfer/Private Sector Applicability
  - -- some technology could be imported immediately by private sector -- govt can share info/make it easier to acquire this technology
  - -- joint DOD/private sector development projects
  - -- civilian use of existing DOD training facilities/technology (Coast Guard example)

For Carlston -- 1 page summary on status of Groups

Harry Kelly 6-6034

DOD Seminar Mtg 4/1-20

DOD - portability of software between hardware platforms (CD Rom)

DOD - use of tech for training reserves
- distance learning
- shared networks (National Guard offered shared use of their comput. network by schools & community)

Dual use.

~~Reasons DOD interested~~

① Lots of industries included in public/private partnership, including defense contractors

② Want to develop capability to buy best Private Sector equip.

DOD Labs - Training - Service - has extensive knowledge base willing to share info in many areas of interest to Administration/DOD

also well connected to DOE labs

Rob -- lots of meat on these bones, must find out where it is'

↘ DOC has most control over

→ DOD thinking about setting up Tiger team, 1-interagency effort -- to follow up on meeting -- flesh out details!

What are talking points for Monday Glynn/~~[illegible]~~ Peach Mtg.

- $75 in Ref conversion $ -- how spent?
- Discussion of past DOD-DOC projects
  - JSEP
  - ~~Ford-UAW~~
  - ~~Seminars in Interactive video~~
  - GATBY (standardized tests)
- other things we can do together
  - This mtg as a pre mtg. -- How can we shape this seminar to be useful -- what does DOD want? What does DOC want

Learning technology, Distance learning -- what problems does DOL (

Anita Jones - DDD tech policy director

Map/Range of opportunities?

↳ Deatch

- Henry to take shot at overview
  - Rob to send over package on DOL programs

Fit into New Jobs - Better Jobs - ... Jobs. Framework
for eventual Reich appeal

↳ Rob - Background
  - key opportunities, issues

↳ Finch working on Vision for future
  - get time

Whitehead issue: - where is $ being spent on Training - any stats? (tech schools, etc)

- ETA funding BCS study of Funding of Training

- expenditures on Training, retraining, etc?

Tony Carnevale?

Clinton Presidential Records
Digital Records Marker

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Publications have not been scanned in their entirety for the purpose of digitization. To see the full publication please search online or visit the Clinton Presidential Library's Research Room.

Conference Announcement
NIST, Gaithersburg, MD
May 18-20, 1994
16 Pages

Conference
Announcement

Integrating Technology and People in High Performance Work Systems

May 18–20, 1994
NIST, Gaithersburg, MD

Sponsored by:

Work and Technology Institute

National Institute of Standards and Technology
Advanced Technology Program

National Center for Manufacturing Sciences

U.S. Department of Commerce
Technology Administration
National Institute of Standards and Technology

DoD Education and Training

TECHNOLOGY AS A LEVER TO PROMOTE PRODUCTIVITY OF LEARNING

Primary Learning Technologies

- Computer-Based Training & Teletraining

Cost-Effectiveness

- Common Approach to Developing Instructional Materials
- Standards for Portability & Interoperability (Re-Use)
- Central Library of Information

DoD-Unique Aspects

- Lessons are oriented to military skills in military environment
- DoD can impose standard processes
- Large user population creates economies of scale

Potential Private-Sector Applicability

- Common interest in technical skills training
- Need to address large, widely-dispersed training populations
- Use of technology to achieve cost-efficiency

DOD Mtg w Hansy Kelly 4-22-94

- Jones -- knows what she must do
  Finch -- delegated
  - ✓ talked to Finch's 2 deputies
  - ✓ Lou & Bartman talked last night
    - very happy
    - Meeting 8:00 am
    - Borodkin will be there
- Finch on leave next week
- need solid recommendation on Moving Forward on Tiger Team
  - Lou already thinking about Tiger Team / outcomes / product
  - Lou worried about workload, wants to form this out
  - Dual-use issue will be in draft
  - answer on clear statement of Anita's support by today

Anita must touch on
- Touch on process & structure of Learning that DOD has researched & studied
- tools -- what can be transfered now or soon

y Business development - 2 ~~High~~ tech companies

↳ Finch on TD next week

↳ Ines
- Presentation
- collect demos ↳
- Institute Defense Analysts
  - Alexandria confer location

↳ complete piece

↳ Mike Smith

↳ Commerce tie-in

Reemployment Act of 1994

Fact Sheet

The "Reemployment Act of 1994" will:

- Create a comprehensive system of reemployment services, training and income support for permanently laid-off workers; build a new network of one-stop career centers to serve as a common point of universal access to education and training, and employment services; and develop a comprehensive national labor market information system.

- Establish a retraining income support program for permanently laid-off workers; provide flexibility to States relating to the unemployment compensation program; and establish a transitional certification process for trade-impacted workers.

This legislative package will build the comprehensive, high-quality reemployment system that American workers need. It is based on what works for getting workers into new and better jobs. Programs that work are customer-driven, offering customized service, quality information, and meaningful choices. They feature job search assistance to help shorten jobless spells, skill training connected to job opportunities, and support services to make long-term training practical for those who need it. They consolidate and streamline the current maze of programs.

The President challenges the Congress to pass the legislation this calendar year. This Act embodies six fundamental principles:

- Universal access and program consolidation
- High quality reemployment services
- High quality labor market information
- One-stop service
- Effective retraining
- Accountability

Title I: Comprehensive Program for Worker Reemployment

Establishes a comprehensive program for reemployment of dislocated workers -- those who are permanently laid-off or are long-term unemployed regardless of the cause of dislocation. It consolidates six current Labor Department dislocated worker programs: Economic Dislocation and Worker Adjustment Assistance Act; Defense Conversion Adjustment; Clean Air Employment Transition Assistance; Defense Diversification Program; Trade Adjustment Assistance; and NAFTA Transition Adjustment Assistance.

- Outreach -- Significant investments in outreach through rapid response (prompt services delivered to large-scale dislocations) and links to worker profiling (early identification of Unemployment Insurance (UI) claimants likely to exhaust UI

benefits before getting new jobs and referring them for services).

- Individual Services -- Services tailored to meet the needs of workers, including the development of individual reemployment plans.

- Comprehensive Reemployment Services -- All dislocated workers have access to a broad menu of basic services including career, labor market, and training program information; program eligibility reviews; testing and assessment to help determine general skills, interests and aptitudes; and job search assistance. Dislocated workers who receive basic services and are unable to get new jobs through such services will have access to more intensive services, including individualized counseling and career planning, diagnostic testing, and development of customized reemployment plans. Relocation assistance, out-of-area job search allowances, and other supportive services such as dependent care and transportation also will be available.

- Program Integration and Career Centers -- Career Centers, competitively selected, will provide access to comprehensive services for all dislocated workers. They may be operated by the Employment Service (ES), Job Training Partnership Act (JTPA) administrative entities, Title I substate grantees, community colleges, area vocational schools, community-based organizations, or other non-profit or for-profit organizations.

- Job Retention -- Governors may use a portion of State reserve funds for skills upgrading for currently employed workers at serious risk of permanent lay-off.

- Quality Training -- Dislocated workers who need new or higher level skills to get good jobs will be able to select education and training providers based on performance information. Education and training funds will be available to each worker for up to 2 years and may be supplemented by other forms of student financial aid.

- Retraining Income Support -- Dislocated workers who need long-term training will have access to income support, beyond regular UI benefits.

- Performance Accountability and Outcomes -- Performance standards for service areas, career centers, and service providers will improve accountability in all States.

- National Grant Program -- The Secretary of Labor will manage a national discretionary grant program to address large scale economic dislocations, provide disaster relief employment assistance, conduct evaluations and research, carry out demonstrations, and provide training and technical assistance to organizations involved in the management and delivery of services.

- Funding Flow -- The Secretary uses a statutory formula to allocate 75 percent of the appropriated funds to States, and States use a similar formula to allocate at least 70 percent to substate areas.

Title II: Retraining Income Support

Part A establishes a program of retraining income support for permanently laid-off workers in long-term training. Beginning July 1, 1995, eligible workers who have exhausted UI benefits, who have a minimum level of tenure with their previous employer, and who are enrolled in long-term retraining will be eligible to receive extended income support.

Part B establishes a Retraining Income Support Account in the Unemployment Trust Fund and sets dollar caps for funding for each fiscal year from FY 1996 through FY 2000. After FY 2000, funding is capped at 20 percent of Federal Unemployment Tax receipts.

Part C finances Retraining Income Support using proceeds of the permanent extension of the current 0.2 percent Federal surtax collected under the Federal Unemployment Tax Act. It also provides for voluntary withholding on UI.

Part D phases out the TAA and NAFTA-TAA programs. Any workers receiving assistance before July 1, 1995, will continue to receive the remaining services and benefits to which they are entitled. From July 1, 1995, through June 30, 1999, workers and their representatives will be able to apply for trade-impacted certification that will make them eligible for services under Title I of the Act and income support under Title II.

Part E amends the Federal Unemployment Tax Act to give more flexibility to the UI system by permitting States to amend their laws to: pay unemployment compensation under a short-time compensation program to an individual who is working reduce hours for an employer in lieu of lay-off; and pay reemployment bonuses to certain individuals as an incentive to rapid reemployment. This part also permanently extends the self-employment assistance program.

Title III: One-Stop Career Centers System

Establishes a national program of grants and waivers to assist States in developing and implementing Statewide networks of One-Stop Career Centers. These networks would provide a common point of access to employment, education and training information and services for anyone who needs help getting a first job, a new job, or a better one, and to employers.

- Workforce Investment Boards -- Local Workforce Investment Boards, selected by local elected officials, will oversee the One-Stop Centers and serve as the "board of directors" for all local workforce programs. (Private Industry Councils under JTPA may become Boards if they meet established composition requirements.)

- One-Stop Career Centers -- Centers may be run by a consortium of organizations, including the ES, the State UI agency, and agencies administering JTPA Title II, and the Title I dislocated worker program under this Act. Alternatively, Governors and local elected officials can opt for a competitive, multiple-operator approach. Under this option, the ES, and other organizations, including dislocated worker career center operators, JTPA programs, community

colleges, and private for-profits and non-profits can be chartered to run One-Stop Centers. Under either option, One-Stop Centers will be required to meet customer-oriented performance measures and will be evaluated against those measures each year.

- Common Services -- Centers will provide basic services to anyone who needs help getting a first, new, or better job, and intensive services to dislocated workers. Centers may also provide intensive services to other individuals. They will coordinate the delivery of a wide range of job training and employment programs. Specialized employer services such as customized screening and referral of job seekers also may be provided.

- Participating Federal Employment and Training Programs -- Programs that will make basic services available through One-Stop Centers are: Title I of the Reemployment Act, Wagner-Peyser, Title II of JTPA, Chapter 41 of Title 38 (veterans' employment and training programs), programs authorized under Federal and State UI laws, and the Senior Community Service Employment Program under Title V of the Older Americans Act. Other human resource programs, such as JOBS, Job Corps, and adult and vocational education, also may provide services through Centers.

- Operating Agreements -- These agreements among the local Workforce Investment Board, the Governor, local elected official(s), participating programs, and Center operators will govern the administration of local One-Stop Career Center systems.

- Grants -- States may apply for competitive planning grants to help them design and develop a comprehensive network, or they can apply for implementation grants with the agreement of local elected officials.

- Waivers -- States also may request waivers of statutory and regulatory requirements for specific Department of Labor-funded programs.

- Quality Assurance -- State-level "customer service compacts" and performance standards for service areas, career centers, and service providers will improve accountability in all States.

- State Human Resource Investment Councils -- Single Councils will be established to advise Governors on ways to consolidate or coordinate programs and resources and on all aspects of the development and implementation of the One-Stop system.

Title IV: National Labor Market Information System

Establishes a National Labor Market Information (LMI) System to provide universal access to timely, accurate, up-to-date, easily accessible, and comprehensive information about where jobs are, necessary skills and experience, location and quality of training programs, and job search

assistance. The LMI system also will provide information on available job candidates and on job, occupational, and skill demand trends. The Secretary will develop a strategy to establish the national LMI system that will be developed in cooperation with other public and private partners.

Title V: JTPA Reinvention Labs

Amends Title II of the Job Training Partnership Act to establish a new part D, "Reinvention Labs", permitting the Secretary to waive Federal statutory or regulatory requirements relating to programs for economically disadvantaged youth and adults to promote implementation of innovative program designs.

Budget Overview

The Administration's FY 1995 budget includes $1.465 billion for reemployment services for dislocated workers. When fully implemented in FY 2000, the system will serve 1.3 million dislocated workers. This represents a total investment of $13 billion over the five-year period -- FY 1995-FY 1999: $9.9 billion in discretionary spending, $2.0 billion in capped mandatory funds, and $1.25 billion on One-Stop Career Centers. The mandatory spending under the bill is fully offset over the five-year period.

SCHOOL-TO-WORK OPPORTUNITIES ACT OF 1993

Fact Sheet

The School-to-Work Opportunities Act, jointly administered by the Departments of Education and Labor, will bring together partnerships of employers, educators and others to build a high quality School-to-Work system that prepares young people for careers in high-skill, high-wage jobs.

Key Strategies for Building School-to-Work Systems:

- The legislation allows for flexibility so that programs can address local needs and respond to changes in the local economy and labor market. While the legislation requires core components and goals, it does not dictate a single method for fulfilling those requirements. Multiple sources of support -- federal grants to states, waivers, direct grants to local partnerships, and high poverty area grants -- will allow all states to build School-to-Work systems within the first few years.

- States and localities can build School-to-Work systems upon existing successful programs -- such as youth apprenticeship, tech-prep education, cooperative education, career academies, and school-to-apprenticeship programs.

- The legislation will promote the coordination of state, local and other federal resources. When the School-to-Work funds end, the programs will be supported by other resources.

- The active and continued involvement of local business, education, union and community leaders is critical to the success of School-to-Work programs.

- The legislation will:

  -- establish required components and goals of every School-to-Work program in the nation;

  -- provide development grants for all states to plan and create comprehensive, statewide School-to-Work systems;

  -- provide five-year, implementation grants to states that have completed the development process and are ready to begin operation of School-to-Work systems;

  -- provide waivers of certain statutory and regulatory program requirements to allow other federal funds to be coordinated with comprehensive School-to-Work programs;

  -- provide direct implementation grants to localities that are ready to implement School-to-Work systems, but are in states that have not yet received implementation grants; and

-- provide direct grants to high poverty areas to address the unique challenges of implementing School-to-Work systems in impoverished areas.

Basic Program Components

- Every School-to-Work program must include

  -- Work-based learning that provides: a planned program of job training or experiences, paid work experience, workplace mentoring, and instruction in general workplace competencies and in a broad variety of elements of an industry.

  -- School-based learning that provides: career exploration and counseling, instruction in a career major (selected no later than the 11th grade); a program of study that is based on high academic and skill standards as proposed in the Administration's "Goals 2000: Educate America Act," and typically involves, at least one year of postsecondary education; and periodic evaluations to identify students' academic strengths and weaknesses.

  -- Connecting activities that coordinate: involvement of employers, schools and students; matching students and work-based learning opportunities; and training teachers, mentors and counselors.

- Completion of a School-to-Work program will lead to a high school diploma; a certificate or diploma from a postsecondary institution, if appropriate; and an occupational skill certificate. The certificate will be a portable, industry recognized credential that certifies competency and mastery of specific occupational skills.

State and Local Governance

- The Governor, the chief state school officer, and state agency officials responsible for job training and employment, economic development, postsecondary education, and other appropriate officials will collaborate in the planning and development of the state School-to-Work system.

- Partnerships that consist of employers, secondary and postsecondary educational institutions, labor organizations, and other local community and business leaders are responsible for designing and administering the local School-to-Work programs.

Federal Grants to States and Localities

- State and local applications for direct federal grants will be submitted to a peer review team composed of federal staff and outside experts in education and training. State applications for implementation grants must include a plan for a comprehensive statewide system which shows how a state will meet the basic program elements and required outcomes. In addition, states must show how the programs will ensure the opportunity to participate is given to economically disadvantaged students, low achieving students, students with disabilities and dropouts.

- Localities will apply for subgrants administered by the states. The state process for distribution of subgrants will be reviewed and approved by the federal government.

Voluntary Skill Standards and Certification

Fact Sheet

Under the leadership of Secretaries Robert Reich and Richard Riley, the Departments of Labor and Education have intensified their commitment to the development of a national system of voluntary skill standards and certification. Most recently, the Administration introduced and the Congress passed the "Goals 2000: Educate America Act." This act underscores the need to strengthen the connection between education and employment, specifically through the establishment of a National Skills Standards Board. This Board would ensure a framework for the development and implementation of a national system of voluntary partnerships which have the full and balanced participation of business, industry, labor, educators, and other key groups.

Why Skill Standards?

For decades America has held the competitive advantage in the world marketplace on the basis of superior mass production. Now we find ourselves in a new economic environment where this track record is no longer sufficient to ensure our continued success. Today, there is increased emphasis on quality, variety, timeliness, customization, and convenience. Furthermore, with the increased mobility of capital and technology, it is easy to replicate the factors of production anywhere in the world, with one exception - workforce skills.

The skills, adaptability, creativity, and know-how of American workers must be the foundation for our continued competitiveness. Our problem lies in the lack of connection between the skills needed in the workplace and the skills imparted through education and training. We are further hindered by the limited range of nationally recognized credentials; these are usually reserved for the college-educated with few options for the 75 percent of Americans who do not obtain a four-year degree.

This results in increased hiring and training costs, restricted employment opportunities, lack of quality assurance, and a direct challenge to our ability to compete. There is an emerging consensus in America that a national skill standards and certification system is the natural cornerstone of our workforce development strategy.

Skill Standards and Certification: Benefits For All

The standards and related certification may be used to inform decision-making in all sectors of the economy. For example,

- **By industry** as a vehicle to inform training providers and prospective employees of skills required for employment;
- **By employers** to reduce the costs and legal risks associated with the assessment of job candidates and make more objective employment decisions;
- **By unions** to increase members' employment security through access to

competency-based training and certification;

- **By workers** to protect against dislocation, pursue career advancement, and enhance their ability to re-enter the workforce by having a work portfolio based on training to industry standards;

- **By trainers and educators** to determine appropriate training services to offer; and

- **By government** to protect the integrity of public expenditures by requiring that employment-related training meet industry standards where they exist.

Examples of Skill Standards

The American Electronic Association, one of six DOL pilot projects, has made considerable progress in the development of voluntary skills standards for three occupational areas in their industry. While they have not yet been submitted for the validation process, the draft standards consist of three parts; critical functions, competency modules, and key elements.

For example, one of the critical functions of an administrative/information services person is "manage schedules and tasks to achieve objectives." A competency module associated with this function is "plan and coordinate travel arrangements for customers." The key elements are "research travel options" and "book travel arrangements." These standards is not yet complete as the performance criteria have not yet been developed.

To: Mike Schmidt
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From a. Packer
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Where the Jobs

How Clinton Can Find Markets for the Goods Am

By Arnold Packer

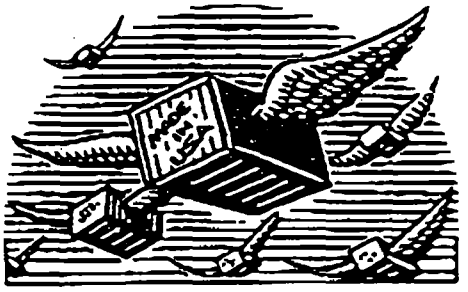
"JOBS, JOBS, jobs—we will create the high-wage jobs of the future." That was Bill Clinton's mantra in 1992. And with his dramatic win on the North American Free Trade Agreement, his hosting of the Asian summit in Seattle, and his hopes for a General Agreement on Tariffs and Trade by Dec. 15, he is continuing to campaign on the issue. Nevertheless, as Tom Donahue, secretary treasurer of the AFL-CIO, said last week, the president still has to "show people he is able to create jobs in America."

The best, and perhaps the only, way to meet the "good jobs" challenge is to dramatically increase exports to the world's growing economies. At least during his first term, President Clinton will not find his opportunities in Europe or Japan. Instead he will have to look to the regions that have absorbed so much of his energies these last few weeks: Asia and Latin America.

Exports to the private sector—whether they be consumer products or investment goods—are probably best left to private markets. But the federal government does have a role. Military exports provide a good model for how the Clinton administration might proceed. In the 1960s, the Department of Defense financed the research and development and helped establish the production lines for a multitude of weapon systems. The Pentagon provided further help, in the form of training and technical assistance, so that foreign buyers could effectively use the new systems. As a result, America exported billions of dollars worth of military equipment during the Cold War (and is continuing to do so), thereby creating good jobs for American workers. Developing military capacity is not the same as developing health or transportation systems. Yet many aspects of this defense model can be adopted by other government agencies.

Exports to foreign government ministries should become a top priority. Asia is the best opportunity. Over the last 20 years East Asia has averaged 7 percent growth compared to 2.5 percent in the rich countries. The World Bank estimates that East Asia's economy will grow twice as fast as the rest of the world and even India's will grow 50 percent faster. The Economist guesses that East Asia alone will contribute more additional output than North America and the European Community combined during the 1990s. More important for potential American jobs is the common prediction that Asia, not including Japan, will spend $1 trillion on infrastructure in the 1990s.

Most of this will be spent by government ministries. Take Indonesia as an example. Its GNP is expected to double in the current decade, from about $100 billion in 1990 to over $200 billion in the year 2000. It has already spent heavily to bring roads and electricity to rural areas and has modernized parts of Jakarta. As Indonesia continues to grow it will spend more on health, education and the environment; it will invest in financial, transportation and communication systems and other hallmarks of industrial countries. If the United States acts swiftly to take advantage of these markets, especially now when dollar-yen and dollar-mark exchange rates are so favorable, Clinton's campaign promise of 1992 can be redeemed by 1996.



Consider education and training or, as it is felicitously known, human resource development. Education is a big employer in the United States. This sector accounts for almost 10 million jobs (including public and private institutions) and added 300,000 jobs annually in 1988-91. The heightened emphasis on developing human resources is good news for educators. Weak state and local finances, a sense that the education bureaucracy is overstaffed and the financial squeeze on colleges are the bad news. Fortunately, education and training are now universally seen as the key to economic growth. Most importantly in terms of export markets, technology—from satellites to computers—is seen as a major component of education's future.

American firms, such as IBM, Apple and hundreds of smaller companies, are the leading producers of educational technology. In education, as in health, the federal government c finance the R&D needed to create effecti products that can first serve domestic nee and then be exported. For example, a compu er-driven course to teach English as a Seco Language has its uses both here abroa And our Departments of Education and Lab can be of assistance if they develop the sam relationship with their counterpart ministri that the Pentagon did with foreign defens ministries.

Next consider the health sector and the D partment of Health and Human Service (HHS). The health sector employed 11.5 m lion persons in 1991. Over the last few year the health sector added about one-half millio jobs annually. But the growth in our healt care bill—and the jobs it pays for—are a b part of our economic and deficit problem Controlling health care costs means slowin job growth. This slowdown can be offset American firms increase their export of good such as pharmaceuticals (or the equipment t manufacture them) and services, such as ho pital management systems. Our Departmen of Education, Labor and HHS could finance th development of domestic products and assi their counterpart ministries in Asia and Lat America in employing them: traffic control sy tems, technology for police and fire protectio and environmental products come readily mind.

The Departments of Agriculture and Cor merce also promote U.S. exports but, unlik the Defense Department, they are rarely ab to fund the development of services and pro ucts. This model fits other federal agenci such as Housing and Urban Developme (HUD). Six million Americans are employed construction and real estate, 600,000 th in 1991. To promote employment grow HUD should work with U.S. firms to encou age the export of sophisticated constructio materials (rather than unfinished material lik logs) and the technology incorporated in su things as "smart" buildings. Cities in many d veloping countries are building office space a there is every reason to use American equi ment and technology.

About 5.4 million persons work in transpo tation services or manufacturing transport tion equipment, such as autos and airplane The bad news in these sectors is the problen

Arnold Packer is a senior fellow at the Johns Hopkins Institute for Policy Studies and co-author of "Workforce 2000."

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ere the Jobs Are

Markets for the Goods American Workers Make Best

producers of educational technology. In education, as in health, the federal government can finance the R&D needed to create effective products that can first serve domestic needs and then be exported. For example, a computer-driven course to teach English as a Second Language has its uses both here and abroad. And our Departments of Education and Labor can be of assistance if they develop the same relationship with their counterpart ministries that the Pentagon did with foreign defense ministries.

Next consider the health sector and the Department of Health and Human Services (HHS). The health sector employed 11.5 million persons in 1991. Over the last few years, the health sector added about one-half million jobs annually. But the growth in our health care bill—and the jobs it pays for—are a big part of our economic and deficit problems. Controlling health care costs means slowing job growth. This slowdown can be offset if American firms increase their export of goods, such as pharmaceuticals (or the equipment to manufacture them) and services, such as hospital management systems. Our Departments of Education, Labor and HHS could finance the development of domestic products and assist their counterpart ministries in Asia and Latin America in employing them: traffic control systems, technology for police and fire protection, and environmental products come readily to mind.

The Departments of Agriculture and Commerce also promote U.S. exports but, unlike the Defense Department, they are rarely able to fund the development of services and products. This model fits other federal agencies such as Housing and Urban Development (HUD). Six million Americans are employed in construction and real estate, 600,000 less than in 1991. To promote employment growth HUD should work with U.S. firms to encourage the export of sophisticated construction materials (rather than unfinished material like logs) and the technology incorporated in such things as "smart" buildings. Cities in many developing countries are building office space and there is every reason to use American equipment and technology.

About 5.4 million persons work in transportation services or manufacturing transportation equipment, such as autos and airplanes. The bad news in these sectors is the problems faced by the airlines and aircraft manufacturers. The Department of Transportation already plays a strategic role in sustaining them. The recent, apparently successful effort to have the Saudis shift a $6 billion jet aircraft order from Airbus to Boeing and McDonnell Douglas is a (too rare) case in point. That role can be increased, however, to include air and road traffic management technology.

Agriculture and food stores accounted for 7.3 million jobs in 1991. But this sector is only producing 100,000 new jobs annually, many of them at low wages. The falling dollar and the growth prospects in the developing world offer new opportunities. Although the Agriculture Department already pays considerable attention to U.S. agricultural exports, might not the department help American supermarkets become involved in food distribution overseas providing greater markets for U.S. food processors?

The hospitality industry includes restaurants, tourism and lodging. The good news in this area is 9.3 million jobs in 1991 and 200,000 new jobs every year since 1988. The bad news, of course, is that a lot of these jobs are "hamburger flipping"—short-hand for a lack of career ladders, low pay scales and high turnover. Some observers believe that hospitality and tourism (including the airlines) will be the world's largest industry by 2025. Developing countries, with considerable government investment, will build hotels, airports and restaurants to meet the growing demand. U.S. firms are already heavily involved, but again federal agencies can help more than they have in the past. When Singapore built its modern airport a few years ago, U.S. firms provided only the electronic billboards.

ILLUSTRATIONS BY JOHN MCDONALD FOR THE WASHINGTON POST

Almost 11 million of the nation's jobs are in finance and insurance firms or business services. Domestically, the large banks and insurance firms, while historically good employers, are laying off workers as they restructure around new information technology. Internationally, however, developing nations will need to strengthen their financial systems. This phenomenon has not gone unnoticed by U.S. banks and financial firms but, again, the Treasury Department could assist.

The U.S. government (federal, state and local), outside of health and education, employed 9.1 million people in 1991 and added 100,000 jobs annually in the years 1988-91. Cutting deficits and reinventing government may mean fewer government workers. But the same technology and expertise that are used for these purposes at home can be sold to counterpart agencies abroad.

Wholesale and retail trade, even excluding food stores and restaurants, is a very big employer, accounting for almost 15 million jobs. But the nation is now "overstored"—as Sears, Macy's and others can attest to—and employment has been declining in this sector. Still, Wal-Mart is growing and a new way of merchandising may emerge in the next four years. Again, the Department of Commerce can help export these improvements, providing access to foreign markets for U.S. firms.

Remaining sectors accounted for 28.5 million jobs in 1991. Among those were another 16.6 million manufacturing jobs, including producers of cellular phones, faxes and other products that few would have predicted four years earlier. But these manufacturing employees also include those working in defense, aerospace and pharmaceuticals whose jobs are threatened by the effort to reduce the deficit. All of these could (and do already) sell to the growing developing world. The Commerce Department can help American computer, telephone and communication companies gain a larger share of what fast-growing nations will inevitably spend for these purposes.

Vigorous export growth, coupled with moderate domestic demand, can add 8 million good jobs by 1996 and set the nation on the high-wage jobs track for the 21st century. If the health and education sectors alone add jobs slightly faster than their recent rate, half of the 8-million-job problem will be solved. The president could then assign the remainder of the 8-million-jobs pledge to his other Cabinet secretaries. The reports they provide should supply the debating points Clinton will need in 1996 when "jobs, jobs, jobs" is Topic A once again.

U.S. DEPARTMENT OF EDUCATION
OFFICE OF THE DEPUTY SECRETARY

OFFICE OF EDUCATIONAL TECHNOLOGY

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FROM: Jonathan Hoyt
Office of Educational Technology
202-401-1444

REMINDER: There will be a CET staff-level meeting to finalize this guidance Tuesday, April 5 from 10:30 - 12:00 in Room 4003 of the Department of Education, 400 Maryland Ave., SW.

** 2 pages to follow **

STRATEGIC GUIDANCE FOR THE FY 1996 FEDERAL INVESTMENT IN EDUCATIONAL TECHNOLOGY R&D

Recent developments in information and communications technology provide unprecedented opportunities to increase the effectiveness and productivity of the nation's education and training systems. However, the small scale and wide dispersal of federal R&D investments do not ensure that the nation will harness the full potential of technology to improve education and training. Similarly, private sector R&D, which must respond primarily to market forces, has not fully turned its attention to these critical areas. Therefore, it is essential that the Administration develop a focused agenda for the federal investment in R&D in technology for education and training. that will focus the federal investment on areas that will yield the maximum benefits for the education and training communities.

The President's statement of February 22, 1993, entitled *Technology for America's Economic Growth, A New Direction to Build Economic Strength,* and the Administration's statement on the National Information Infrastructure, *The NII: Agenda for Action,* are the basis for this policy direction. The February 22, 1993 statement indicates that "public investment will be provided to support technology that can increase the productivity of learning and teaching in formal school settings, in industrial training, and even at home." The *Goals 2000: Educate America Act,* the Administration's agenda for education reform, provides support for state and local efforts to use of technology in K-12 education to help learners meet challenging content and performance standards developed by states and school districts. R&D in educational technology is needed to increase the positive impact of these state and local investments in technology.

The National Science and Technology Council's Committee on Education and Training has been charged with developing a succinct FY 1996 statement of priorities for R&D in technology. The following critical areas have been identified by the Committee:

1. **Development of high-quality, affordable learning tools.** While the educational software market is developing rapidly, it is dominated by products designed for home or computer laboratory use. These products often simply reinforce traditional instruction. Software and tools are needed that offer challenging and expanded content, that are consistent with new standards, and that support learner-centered classroom instruction.

2. **Identification of effective models for technology use.** These models should include attributes such as network configurations, infrastructure, state and local technology plans, professional development, and ongoing operational support, in all learning settings, including schools, workplaces, and the home.

3. **Basic research on technology-supported learning.** Designing new paradigms for instruction and learning environments will involve fields as diverse as anthropology, computer science, education, linguistics, and psychology. Fundamental knowledge from these efforts can form the basis for changes in schooling and workplace practices.

4. **New models of assessing progress in learning** that include a richer set of measurements of learning outcomes made possible by technology, including measurements of productivity gains in the workplace.

5. **Technology and networking demonstrations: innovative applications.** These demonstrations of how technology and connectivity to the NII can support effective education and training practices, must include a strong evaluation component and must address issues of scalability. Areas of special concern for demonstrations include:

   - the educational performance of disadvantaged youth and youth with disabilities. Current research suggests that these groups gain significantly from the introduction of instructional technologies. A more comprehensive base of evidence is needed, however.

   - promotion of effective school-to-work transitions.

   - instructional settings that support the achievement of challenging content and performance standards.

   - provision of training and re-training needed to help displaced workers quickly find new and better jobs; to provide all workers with the opportunity for skill development and career advancement; and to assure that the workforce is adequately prepared to participate in the high-performance workplace of the future.

   - professional development of teachers and instructors. Instructional technologies frequently fail due to inadequate professional development. More must be learned about the best ways to support teachers and instructors in the use of technology.

   - parental, community, and private sector involvement in education.

In setting these priorities, CET should consider the possibility of creating one or more public-private consortia to conduct R&D.