

Department of Energy

Technology-Supported Learning Project Plan

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U.S. DEPARTMENT OF ENERGY

**U. S. Department of Energy
Technology-Supported Learning Project Plan
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U. S. Department of Energy Technology-Supported Learning Project Plan

1. Purpose of the Project Plan

This Project Plan identifies the tasks that will establish the corporate foundation and infrastructure required to implement technology-supported learning throughout the Department of Energy. This foundation and infrastructure will ensure that technology-supported learning efforts across the Department are systematically accomplished, sustainable over time, and coordinated in such a way as to derive the greatest benefit and cost savings. This Plan will be amended as new tasks are identified.

2. Introduction

The ability of the Department of Energy to successfully and safely complete its current and future missions depends heavily on the technical competence of its Federal staff and contractors. As missions change and mission-related technology advances, the Department is challenged with retraining its workers and cultivating an environment wherein employees can learn faster, retain more of what they have learned, and do so at lower costs than traditional methods of instruction permit. This challenge could not come at a better time. As the Department restructures its information management capabilities, delivering workforce training and development via electronic means is now within our grasp. For this reason the Department's training and information management communities have partnered and initiated the Technology-Supported Learning Program. The ultimate goal of this effort is to use advanced training technology to deliver learning activities to the desktop wherever such delivery can be demonstrated to improve learning outcomes and reduce costs.

In 1995, the Department began to place emphasis on technology-supported learning. This came as the result of an initial Departmental study concerning both 1) the role of technology in learning and 2) its applicability to the Department of Energy environment. Then, in April 1997, the Department completed an extensive business case that focussed on quantifying cost-savings and other tangible benefits to be achieved through the use of technology in learning environments. The results were dramatic. The DOE Corporate Technology-Supported Learning Business Case revealed how the use of technology could save the Department tens of millions of dollars in just the first five years of implementation. This Project Plan is the next major step towards implementation of this Program.

A recent Presidential memorandum (Attachment 1) validates the Department's decision to formally integrate the use of technology-supported learning. The memorandum directs that a government-wide effort be undertaken to explore how technology can support life long learning. The Department, in support of this directive, is now moving forward with this Plan documenting its approach to implementation.

Preparatory to creating this Project plan and related to the planning needs set forth by the Presidential memorandum, a Department-wide Resource Assessment was developed. The purpose of this "living" assessment is to gather current baseline information concerning the state of training and technology-based infrastructure across the Department. The Resource Assessment is a web-based tool coupled with a database that can be continuously updated. This tool is being used to update the Technology-Supported Learning Business Case dated April 1997 and will be used to track the Department's progress in implementing the Technology-Supported Learning Program.

3. Scope of the Project Plan

This Plan describes the organization, functions, and work breakdown required to establish the corporate foundation and infrastructure for technology-supported learning. The Plan has been written consistent with the requirements contained in DOE Order 430.1, *Life Cycle Asset Management*.

This Plan identifies what needs to be accomplished to establish the needed foundation and infrastructure. This plan provides a solid foundation for site-specific implementation plans (which need to be developed locally) and the foundation for a corporate Technology-Supported Learning Implementation Plan. Specifying how these complex-wide tasks are to be accomplished will be the responsibility of the TSL Program Team (to be formed subsequent to the approval of this Plan). This Team will determine the sequence, approach, schedule, and costs associated with each of the tasks.

All elements of this Project Plan are in concert with the Department's Information Management Strategic Plan. This Project Plan is largely based on 1) input received from the Technology-Supported Learning Program Committee meeting conducted March 3-5 1998 in Washington D. C. and 2) the three recommendations excerpted from the Department's Technology-Supported Learning Business Case (DOE/HR-0177, available through the Government Printing Office, or at the Department's on-line Clearinghouse for Training, Education, and Development at <http://cted.inel.gov/cted>). The recommendations are as follows:

- ***Develop a corporate approach to Technology-Supported Learning***

technology-supported learning will improve learning effectiveness and resulting on-the-job performance; increase the overall system efficiency through reduced redundancy and decreased learning time; and improve the quality, interoperability, and consistency of training through the use of appropriate standards.

- ***Adopt a multi-technology solution for delivery of cross-cutting education and training***

This solution proposes the use of a mix of existing technologies across the Department, optimizing their function as the state-of-the-art matures, and investigating new training technologies as they evolve.

- ***Establish and cultivate needed resources***

Acquire resources to support implementation of the Technology-Supported Learning Program through partnering agreements, coordination with Centers of Excellence, development of appropriate in-house course conversion capabilities, and development of an approved list of products and services.

4. The Partners and Their Goals

Both partners in this effort, the training and information management communities, share common goals. Critical to successful learning are the presentation of training and the technology to present that data. As such, the effectiveness of the Department's information management processes are integral to the success of the Technology-Supported Learning Program. Examination of some of the primary drivers for the missions of the training and information management communities further highlights how the communities, and their efforts, are integral to one another.

The Department takes a strategic view with respect to its human resources by ensuring that the training needed by its Federal and contractor staff are timely, accessible, and relevant to the job. Training drivers for the Department include:

- Department of Energy Strategic Plan
- Department of Energy Implementation Plan responding to Defense Nuclear Facilities Safety Board Recommendation 93-3
- Department of Energy Training and Development Business Plan
- *The Government Performance and Results Act - 1993*
- Presidential Memorandum of January 30, 1998 - *Enhancing Learning and Education Through Technology*
- DOE Order 360.1, *Training* (Federal employees)
- DOE Order 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities* (Contractor employees)

There are several primary drivers for the Office of Information Management's efforts:

- Department of Energy Strategic Plan
- *The Government Performance and Results Act - 1993*
- *The Paperwork Reduction Act - 1995*
- *The Clinger-Cohen Act - 1996* (formerly known as the Information Technology Management Reform Act)
- The Department of Energy Information Management Strategic Plan

These drivers, while having different sources, focus on many of the same fundamental principles as do the information management communities' drivers; chief of which is maximum access to information in a universal, systematic and sustainable way. As a result, both communities enter the partnership with the same vision of the cultural outcomes to be achieved through their collaboration. These include:

- Justifiable and defensible budgets based on solid performance measures
- Sustained and mutually beneficial collaboration between the two communities
- Widespread and uniform access to corporate systems facilitating interoperability and ease of use
- Mutual commitment to the quality of services and products
- Ease of facilitating agreement concerning the future direction of the Department

Where both the training and information management communities provide vital services to the Department of Energy, the technology and infrastructure made available by information management is critical to the delivery of effective training via advanced training technologies. Close interdependence between the two communities is critical to the success of the Corporate Technology-Supported Learning Program.

5. Applicability

The policy and directives derived from this Plan are applicable to the Department of Energy and, so far as contractual arrangements allow, the various contractor organizations within DOE. (Where not legally binding, voluntary adoption by the individual contractors of resulting policies and directives is encouraged.) Implementing documents will be written to cover Technology-Supported Learning Program management practices by each of the participants consistent with the schedule for implementation to provide consistency between the resulting procedures and this document.

6. Vision, Mission, and Goals

Vision: *The Department of Energy aggressively utilizes state of the art technology-supported learning methodologies to improve the effectiveness and efficiency of Departmental learning activities.*

Mission: *To establish the infrastructure, capability and organizational culture that promotes and ensures the effective and efficient application of technology-supported learning methodologies across the Department of Energy.*

Goals:

1. Identify equipment, technology, and other resource requirements and baselines for the effective implementation, maintenance and upgrade of technology-supported learning.
2. Evaluate the readiness of the Department and the policies and standards required to optimally harness technology-supported learning.
3. Identify instructional strategies and methods that will improve the quality and effectiveness of technology-supported learning activities.
4. Identify learning activities that have cross-cutting applicability that would make them candidates for implementation via technology-supported learning approaches.
5. Develop standards for technology-supported learning format, structure, and process that will promote uniformity, reduce duplication of effort, and improve usefulness.

6. Identify evaluation criteria and parameters to measure the instructional effectiveness and cost savings associated with technology-supported learning as an alternative to conventional learning activity delivery.
7. Conduct pilots to validate system readiness, demonstrate the effectiveness of technology in improving learner outcomes, and evaluate cost vs. performance.
8. Develop a cooperative relationship with other government agencies, the private sector, universities, laboratories, and other educational institutions involved in technology-supported learning to share resources, products, and lessons learned.
9. Optimize the use of existing technology-supported learning facilities and capabilities.
10. Eliminate redundancies in cross-cutting training and education, course development and delivery to reduce costs, increase efficiency, achieve the highest quality courses, and establish Department-wide consistency.
11. Provide training and educational opportunities via technology-supported learning throughout the Department of Energy to maintain technical competence.

Attachment 2 shows the relationship between the Presidential Memorandum (Attachment 1) and the above stated Technology-Supported Learning Program Goals.

7. Assumptions

The following list of assumptions is provided to further define the boundaries and issues associated with implementation of this Plan. Some of these assumptions pertain to the Department, others are completely grounded in the pace of technology developments. All affect the Department's ability to implement the Program.

1. Funding and others resources will be available to implement project plan.
2. A network of training and information management representatives from Department of Energy HQ, Field, and contractor organizations provide a knowledgeable and consistent resource to support implementation activities.
3. Technology-Supported Learning Program activities must support all developmental, professional, and technical qualification programs.
4. Technology-Supported Learning Program infrastructure will be integrated

with the Corporate Human Resource Information System.

5. As technologies continue to evolve, infrastructure will keep pace.
6. Security measures will protect DOE concerns while allowing technology-supported learning systems to operate.
7. Alliances within and between the Department, other agencies of the government, institutions of higher education, and the private sector will further support implementation and reduce costs.

8. Performance Objectives

The success of the Department of Energy Technology-Supported Learning Program will be measured by performance objectives developed in three primary areas:

1. Quality - A consistently high level of quality in learning materials
2. Transportability - Learning materials can be readily accessed and used by all sites.
3. Cost savings - Documented savings are achieved in the analysis, design, development, and delivery of learning materials.

The specific performance measures for the tasks in this plan will be developed by the TSL Program Team.

9. Organizational Structure

The Technology-Supported Learning Program is supported by a Department-wide team composed of both training and information management representatives from across the Department. The program is championed by the Director of Training and Human Resource Development and the Chief Information Officer. The TSL Program Manager and team receive direction from the Training and Development Coordinating Group and the Information Management Council. The Corporate TSL Organizational Structure is depicted in Figure 1.

Corporate TSL Program Organizational Structure

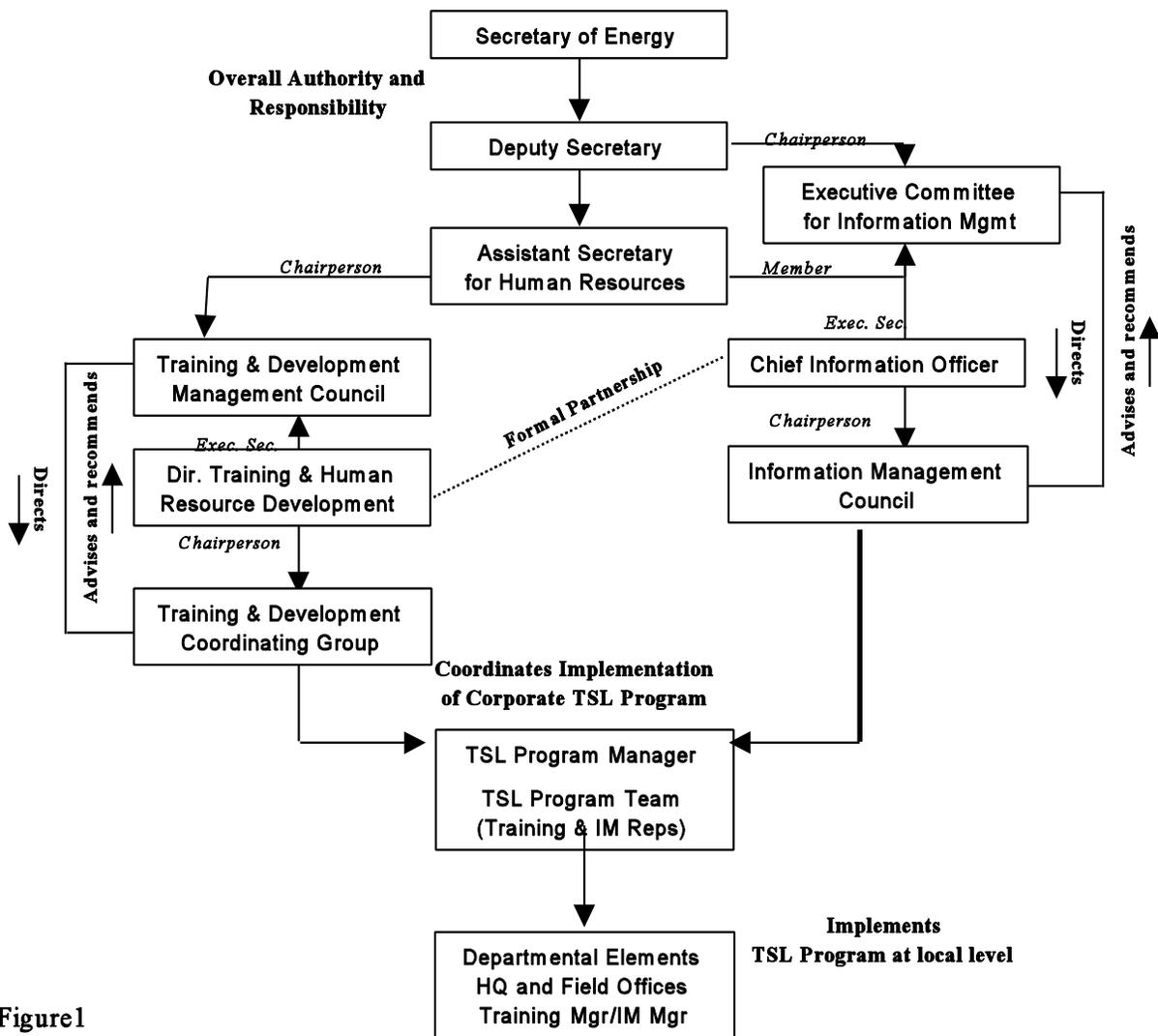


Figure 1

10. Technology-Supported Learning (TSL) Work Breakdown Structure

The following Work Breakdown Structure (WBS) describes the activities needed for the Department to coordinate crosscutting technology-supported learning projects and achieve the economies of scale associated with the development and implementation of technology-supported learning processes and products. Upon completion of these tasks, the necessary infrastructure must be in place so that current and future TSL products can be accessible.

The WBS identifies the means by which technology-supported learning can be utilized throughout the Department in a consistent and, at the same time, flexible manner. The work scope sets forth a set of tasks for the Technology -Supported Learning Program Team that will provide the following throughout the Department: 1) uniform deployment and easy accessibility to technology-supported learning activities, 2) optimum use of technology-supported learning, and 3) increased awareness and understanding of the value of using technology-supported learning at individual sites, as well as complex-wide.

The WBS consists of three main groupings: 1) Program Management, 2) technology-supported learning standards, policies, procedures, guidelines and tools, and 3) technology-supported learning hardware and software infrastructure.

1.0 Program management

1.1 Planning and budgeting. Includes elements that involve strategic planning, tactical planning, site coordination, and developing and maintaining TSL activities at the department level.

1.1.1 Plan TSL implementation. Includes tasks to develop an implementation plan that clearly defines roles and responsibilities of the TSL participants and their relationship to the IM Group. Participants shall include members from each DOE site and program office, other agencies, and the private sector to support strategic TSL decision-making and ensure leveraging of TSL capabilities. The plan will define:

- Roles and responsibilities
- Detailed work breakdown (specific tasks)
- Milestones/schedule
- Funding strategies

1.1.2 Setup Program budget. Includes tasks related to:

- Defining budget categories
- Researching funding options
- Issuing budget guidance

1.2 Program implementation and leadership. Includes elements necessary to effectively organize and manage the TSL program.

1.2.1 Implement policies and guidelines. (See “TSL policy and procedure development” activity below. Includes tasks to ensure that newly defined and existing policies are understood and incorporated appropriately into this program in the areas of:

- Return on investment policy
- Quality Assurance Policy
- Training Policy (360.1)
- Information Management Policy
- Reporting guidelines
- TSL Standards (newly defined as per activity below)

1.2.2 Manage the TSL Program. (The specifics of many of these management tasks are further defined under the TSL infrastructure development activity below). Includes tasks to:

- Provide formal program leadership and representation
- Report to Training and Development Coordinating Group and Training and Development Management Council
- Distribute and coordinate plan throughout Department
- Disseminate and exchange information
- Administer budget /resources
- Monitor Technology Advancements/Efficiencies
- Assist local sites in setting up and implementing local plans
- Maintain resource assessment

1.2.3 Establish and promote internal and external partnerships.

Includes forming partnerships and teams comprised of DOE, other agencies, private sector, and educational members, to support TSL strategic planning and to ensure that maximum leveraging of existing and future TSL resources and capabilities occurs.

Promoting internal partnerships includes tasks to:

- Coordinate closely with Department of Energy Training Centers of Excellence
- Foster sharing of developed TSL-compatible courses and cost-sharing of development and delivery
- Foster cross-communication through information exchange through Clearinghouse
- Bring parties together to identify top-priority high-savings opportunities

Promoting external partnerships includes tasks to:

- Participate as part of Federal initiatives in this area
- Explore opportunities with public, educational and private sectors
- Establish formal relationships, where appropriate, for shared use of capabilities, content, and products
- Promote local external partnering (e.g. Federal training working groups as in Albuquerque and Denver)

1.2.4 Evaluate and assess Program success. Includes tasks that involve developing instruments for measuring Program success and the impact of TSL learning:

- Analyze TSL performance improvement needs and opportunities
- Develop performance measures to track program success
- Develop standard instruments to measure learning effectiveness
- Measure TSL cost savings and return on investment
- Measure the quality of instruction provided
- Report progress
- Perform problem solving

2. TSL policy and procedure development. This activity addresses the creation and/or adoption of TSL specific policies and procedures.

2.1 Hardware and software standards studies. This activity involves establishing interoperability standards for hardware and software systems.

2.1.1 Identify relevant DOE hardware, software, and systems standards. Includes tasks to:

- Enumerate TSL relevant standards
- Derive implications for TSL Program

2.1.2 Identify relevant industry hardware, software, and systems standards. Includes tasks to:

- Enumerate TSL relevant standards
- Derive implications for TSL Program

2.2 Policy studies. This activity involves establishing appropriate policies, procedures and guidelines for use by DOE in utilizing TSL.

2.2.1 TSL policy and procedure analysis. Includes tasks to:

- Contact best in class organizations for TSL-related policies, procedures, guidelines and tools
- Consider applicability to DOE
- Define specific requirements for DOE policies, procedures, guidelines and tools

2.2.2 Develop DOE TSL policies, procedures and guidelines.

Includes tasks to adapt/create draft policies, procedures, guidelines and tools relevant to DOE in many areas such as:

- TSL justification
- Conventions and Standards
 - interoperability
 - consistency
 - applicability
- Delivery method selection guidance and tools
- Interfacing with new systems (i.e. CHRIS)
- Quality assurance
- Program evaluation including return on investment/effectiveness calculation and evaluation
- Cost-savings reporting
- Partnering policies

3. TSL hardware and software infrastructure and architecture.

This activity addresses any hardware, software, equipment, and network required to facilitate efficient use of TSL between sites and meet TSL architecture needs that reside outside the individual site boundaries. This involves the actual design and construction of a viable and robust TSL system within the Department using a

systems approach.

3.1 Analysis and Design. This activity involves establishing baseline, identifying systems requirements, and identifying, designing and evaluating alternatives.

3.1.1 Assess technology infrastructure capabilities and needs.

Includes tasks to:

- Gather TSL baseline data (already underway)
- Validate baseline
- Maintain baseline

3.1.2 Define formal TSL system requirements. Includes tasks to identify:

- User requirements
- Hardware requirements
- Software requirements
- Constraints, barrier identification
- Security requirements
- Interfacing system/initiatives

3.1.3 Design and evaluate alternative solution paths. Includes tasks working closely with training and IM partners to:

- Identify alternatives to satisfy requirements
- Develop evaluation criteria
- Conduct evaluations
- Make final recommendations
- Develop detailed plans (as per decisions)

3.2. Marketing, implementation, and operations. This activity includes the development of marketing strategies, system implementation, maintenance, and upgrade.

3.2.1 Develop and implement TSL marketing strategies. Includes tasks to:

- Develop communications Plan
- Support business plan marketing
- Enhance user TSL interest and acceptance
- Link strategy to Presidential Memorandum on TSL

3.2.2 Implement system hardware and software. Includes tasks to:

- Procure hardware and software
- Install systems
- Test systems and validate readiness

3.2.3 Operate, maintain, and upgrade system. Includes tasks to:

- Maintain and upgrade hardware, software, and network capabilities
- Assist users troubleshoot problems
- Train users and support personnel
- Provide online help
- Capture and share lessons learned
- Capture statistics/data, conduct appropriate comparisons
- Assess status (effectiveness, efficiency, currency of hardware/software)
- Identify, recommend, and implement improvements

Attachment 1.
Presidential Memorandum

----- For Immediate Release

January 30, 1998

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

SUBJECT: Enhancing Learning and Education Through Technology

The Federal Government continually invests in training its employees. Federal agencies have an obligation to provide the best training for their employees at the lowest possible cost. Federal agency training programs should be model users of new technologies to enhance learning. Many agencies are already improving training by using new technology effectively, but more can be done. New instructional technologies can also make education, at work and at home, easier and more convenient for all American workers. Federal programs that provide financial support for lifelong learning should adapt to the new opportunities technology provides. A Federal Government-wide effort is needed to explore how Federal programs and initiatives can better support the use of technologies for lifelong learning. Therefore, I hereby direct as follows:

1. The National Economic Council (NEC), in consultation with the Chief Information Officers Council (CIOC) as established by Executive Order 13011 of July 16, 1996, the Office of Personnel Management (OPM), and the Office of Science and Technology Policy (OSTP), shall investigate how to make full use of emerging technologies to improve the cost-effectiveness and the quality of Federal training programs. Specifically, I direct that within 6 months from the date of this memorandum the NEC, in consultation with CIOC, OPM, and OSTP, provide me a plan identifying areas in which technology-enhanced training and learning may complement conventional Federal training and learning. The plan should describe how the agencies, when feasible and appropriate, will:
 - (a) make full use of best commercial practices when purchasing instructional software;
 - (b) work with businesses, universities, and other appropriate entities to foster a competitive market for electronic instruction;
 - © develop a model technical approach to facilitate electronic instruction building on existing agency efforts, such as the Advanced Distributed Learning Initiative Partnership; and
 - (d) develop and support a program of research that will accelerate the development and adoption of new instructional technologies.
2. The Secretary of Education and the Secretary of Labor shall work together to promote adoption of the best new ways of using technology to enhance training and education in programs that provide Federal support for education and training.
3. The NEC, in coordination with the Office of Management and Budget, the OSTP, and other appropriate Federal Government entities, shall develop a national strategy to promote high-quality education and training opportunities that can be offered in a manner that is efficient, affordable, and convenient. Industry, universities, labor unions, and other stakeholders should be consulted in the development of the strategy. The strategy shall be completed within 6 months of the date of this memorandum.

WILLIAM J. CLINTON

Attachment 2.

Presidential Memorandum Cross-referenced with TSL Goals

Presidential Memorandum	Technology-Supported Learning Goals
<p>a.) ...use best commercial practices when purchasing instructional software;</p>	<p>Goal 1 - Identify equipment, technology, and other resource requirements and baselines for the effective implementation of technology-supported learning. Goal 9 - Optimize the use of existing technology-supported learning facilities and capabilities. Goal 11 - Provide optimal training and educational opportunities throughout the Department of Energy to maintain technical competence.</p>
<p>b.) ...work with business, universities, and other appropriate entities to foster a competitive market for electronic instruction;</p>	<p>Goal 8 - Develop a cooperative relationship with other government agencies, the private sector, universities, laboratories, and other educational institutions involved in technology-supported learning to share resources, products, and lessons learned. Goal 9 - Optimize the use of existing technology-supported learning facilities and capabilities.</p>
<p>c.) ...develop a model technical approach to facilitate electronic instruction building on existing agency efforts...;</p>	<p>Goal 4 - Identify learning activities that have cross-cutting applicability that would make them candidates for implementation via technology-supported learning approaches. Goal 5 - Develop standards for technology-supported learning format, structure, and process that will promote uniformity, reduce duplication of effort, and improve usefulness. Goal 6 - Identify evaluation criteria and parameters to measure the instructional effectiveness and cost savings associated with technology-supported learning as an alternative to conventional learning activity delivery. Goal 7 - Conduct pilots to validate system readiness, demonstrate the effectiveness of technology in improving learner outcomes, and evaluate cost vs. performance. Goal 9 - Optimize the use of existing technology-supported learning facilities and capabilities. Goal 10 - Eliminate redundancies in cross-cutting training and education, course development and delivery to reduce costs, increase efficiency, achieve the highest quality courses, and establish Department-wide consistency. Goal 11 - Provide optimal training and educational opportunities throughout the Department of Energy to maintain technical competence.</p>

Presidential Memorandum	Technology-Supported Learning Goals
<p>d.) ...develop and support a program of research that will accelerate the development and adoption of new instructional technologies;</p>	<p>Goal 2 -Evaluate the readiness of the Department and the policies and standards required to optimally harness technology-supported learning</p> <p>Goal 3 - Identify instructional strategies and methods that will improve the quality and effectiveness of technology-supported learning activities</p> <p>Goal 6 - Identify evaluation criteria and parameters to measure the instructional effectiveness and cost savings associated with technology-supported learning as an alternative to conventional learning activity delivery.</p> <p>Goal 10 - Eliminate redundancies in cross-cutting training and education, course development and delivery to reduce costs, increase efficiency, achieve the highest quality courses, and establish Department-wide consistency.</p>