Always Ready to Learn
The Coast Guard Advanced Distributed Learning Initiative

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Abstract

"Behind every saved life, enforced fisheries treaty, foiled drug smuggling attempt, and safe port are high-performing Coast Guard people." Coast Guard 2020

The Coast Guard's Advanced Distributed Learning Strategy (CGADLS) sets forth a new paradigm intended to provide access to the highest quality education and training that can be tailored to individual needs and delivered cost effectively, whenever and wherever it is required. The Coast Guards vision harnesses the power of the Internet and other virtual or private wide-area networks to deliver high quality learning. The CGADLP employs a low cost, hybrid approach to using technology by bringing together intelligent tutors, distributed subject matter experts, real time, in-depth learning management, and a diverse array of support tools to ensure a responsive, high quality "learner-centric" system.

To make best use of the technologically advanced equipment the service is deploying on its boats, ships and aircraft, the Coast Guard must have personnel who are just as technically sophisticated and who can access the information they need to operate and maintain this equipment to its best advantage. The Coast Guard's Advanced Distributed Learning Plan is its response to the challenge of providing the information and learning its personnel expect and deserve as they confront their future operational challenges.

Author Biography:

Mr. McCloughan is a Senior Analyst with RWD Technologies specializing in performance support for Fortune 500 Companies. As Chief of the Coast Guards Performance Technology Center from July 1997 to July 2000, CDR McCloughan USCG (ret) was the principle author of the Coast Guard's Advanced Distributed Learning Plan. In addition to a variety of operational assignments, CDR McCloughan had more than 15 years experience improving workforce performance during his active duty career. He has earned Masters Degrees in Management from the Florida Institute of Technology and Instructional Systems Design from Florida State University.

Commander Arnold is the Training Officer at the Coast Guard Training Center in Petaluma, California. He serves as the Coast Guard project lead for Advanced Distributed Learning and has directed many of the Coast Guard's training technology innovations during his most recent assignment as the Chief of the Alternative Development and Delivery Branch at the Performance Technology Center. Commander Arnold is a graduate of the US Coast Guard Academy and has earned a Masters Degree from Old Dominion University in Educational Technology.

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INTRODUCTION

In his FY 2000 Determinations, the Coast Guard Chief of Staff directed development of a comprehensive Coast Guard Plan that takes full advantage of new technologies, human performance improvement methodologies while integrating training. The Coast Guard's vision is to harness the power of the Internet and other virtual or private wide-area networks (WANs) to deliver high-quality learning. It employs a hybrid approach to using technology by bringing together intelligent tutors, distributed subject matter experts, real-time in-depth learning management, and a diverse array of support tools to ensure a responsive, high-quality "learner-centric" system.

Two of the four Strategic Goals identified in the Coast Guard's Performance and Training Strategy address distance learning issues.

Strategic Goal 2 **- Develop a more systematic approach to continuous individual and organizational learning.**

Strategies to accomplish this goal include:

- Employing rapid, low-cost ways to build a more capable workforce.
- Install just-in-time and self-directed learning.
- Develop incentives for continuous individual and organizational learning.
- Create processes and information systems to support organizational learning.

Strategic Goal 4 **- Deploy more cost-effective Electronic Performance Support Systems (EPSS), including instructional technologies, to enhance on-the-job performances and improve training.**

Strategies to accomplish this goal include:

- Publicize successes and appropriate uses of EPSS.
- Plan and resource EPSS infrastructure.
- Systematically convert all or part of select training courses to electronic delivery.
- Collaborate with Systems and Acquisition Directorates in researching technological interventions to improve workforce performance.
- Collaborate with joint military and DOT technology projects that support Coast Guard missions.
- Find up-front funds to invest in electronic performance support systems.

The Coast Guard's Advanced Distributed Learning Plan (CGADLP) is based on DOD initiatives and is designed to establish a system which will employ emerging network-based technologies, and be deployed through a series of incremental changes. The CGADLP creates common standards that enable reuse and interoperability of learning content, lower development costs, and promote widespread collaboration that can satisfy common needs. The plan will enhance performance with next-generation learning technologies, works closely with industry to influence the commercial off the shelf product development cycle, and establishes a coordinated implementation process. It is designed to deliver efficient and effective high-quality tools, instruction, assistance and support continuously to Coast Guard personnel *anytime-anywhere*.

The CGADLP provides a unified "system of systems" for use by all personnel and enables the service to move learning from the present paradigm (predominantly classroom-based) into truly *anytime-anywhere* learning. State-of-the-art communications now allows the Coast Guard to evolve its training programs to exploit existing network-based training to

meet Service needs. The CGADLP will help change the way in which learning is viewed. It leads to a "learner-centric" culture and ensuring that officially required learning is an acceptable and flexibly scheduled portion of the duty day, without penalizing quality of life or long-term health, fitness, and well being.

Resources required to achieve the CGADLP end-state include not only network demands, but also individual access to the World Wide Web and to an Internet-capable computer for every CG user. The plan calls for greater emphasis on the conversion of traditional classroom courseware to a form that is consistent with emerging standards of interoperability and reuse. Infrastructure and Information Technology Support at Training System units are being re-engineered to support a migration to advanced distributed learning. The CGADLP is also appropriate in delivering learning opportunities for civilian personnel, as well as for Reserve and CG Auxiliary personnel at home or at Coast Guard units.

The CGADLP end-state envisions universal use of instructional components that are characterized by:

- *accessibility* from any location, remote or local;
- *interoperability* between all advanced distributed learning instructional platforms, media, and tools;
- *durability* to withstand base technology changes without significant recoding or redesign;
- *reusability* between applications, platforms, and tools; and,
- *cost effectiveness* to provide significant increases in learning and readiness per net increment in time or cost.
- demonstrably *improved* individual and unit performance

Plan Objectives

The objective of the CGADLP is to meet the learning needs of the service in the future and to provide direction and focus to programs that address these needs. There are five elements needed to develop and successfully implement the CGADLP:

- common industry standards;
- interoperable tools and content;
- a robust and dynamic network infrastructure for distribution
- research and development
- supporting resources; and,
- cultural change at all levels of command, recognizing that learning is an official requirement of the duty day

To meet the learning requirements of the future force, the Coast Guard must be capable of providing:

Team Coast Guard: The plan applies to all of our people – military (active and reserve), civilian, and auxiliary.

Totally Prepared: Our people are always ready to stand the watch:

- They are equipped with tools and technologies and they know how to use them.
- They are motivated and believe in a strong, capable, and highly effective Coast Guard.
- They are sufficiently guided by policy, and use processes efficiently.
- They are confident in their ability to perform and have the skills and knowledge to do the job.
- They give freely of their knowledge, skills, attitudes, and abilities so that others can learn.
- They are prepared for today, and are planning for tomorrow.

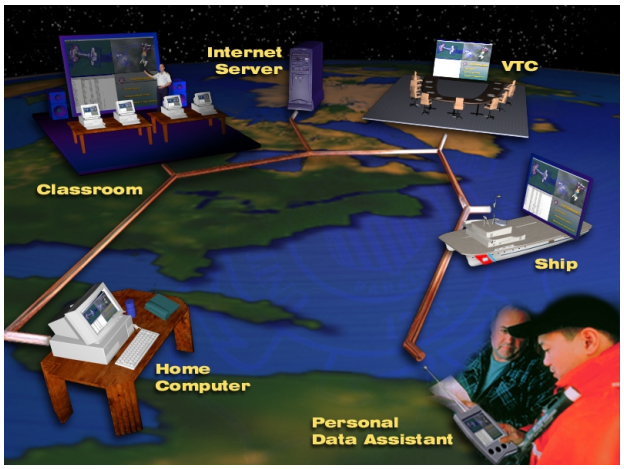
Today and Tomorrow: Our people successfully perform Coast Guard missions in a rapidly changing and very demanding maritime environment. Necessary organizational investments are made which anticipate and adapt to change.

One of the concerns expressed by Operational Commanders is the challenge of having to send their service members away from their units to satisfy education and training requirements or moving that training burden to the operational unit. The organizations move to optimally crewed ships and the accelerating pace of technological change further complicates this challenge. These concerns and the ever-growing complexity of modern systems demand that the Coast Guard re-engineer our education and training systems to take advantage of information-age technologies.

To achieve the vision, *anytime-anywhere* learning must be distributed, just in time and on-demand, and enabled by resource development and exploitation of learning technologies. The strategic shift from

learning solely in the central classroom to learning in the unit, where and when required -- while maintaining quality -- can ensure higher readiness and improve the mission availability of personnel. The indicators of success for the distributed learning investment are measurable in terms of improved unit cohesion, increased availability for operations, and increased operational readiness stemming from unit management of learning assets throughout the Coast Guard.

The CGADLP sets forth a new paradigm intended to implement the WPTS training vision -- to provide access to the highest quality education and training that can be tailored to individual needs and delivered cost-effectively, whenever and wherever it is required.



The Advanced Distributed Learning Plan requires re-engineering the learning paradigm from a "classroom-centric" model to an increasingly "learner-centric" model, and re-engineering the learning business process from a "factory model" (involving mainly large education and training institutions) to a more network-centric "information-age model" which incorporates *anytime-anywhere* learning.

The purpose is not to replace the entire classroom model of training and education within the Coast Guard. There will always be a place for such instruction, particularly where hands-on and practice in psychomotor skills is required. The aim is to provide for the distribution of as much learning as possible while simultaneously maintaining the service-directed standards for quantity and quality of instruction.

Current Initiatives

As addressed in the Plan, the Coast Guard has a broad range of distributed learning plans, programs, and initiatives under way, each in various stages of development and implementation. The Coast Guard has identified several proven technologies that will continue to mature over the next 10-15 years. These technologies are already widely used by government or industry, have excellent growth potential, and can successfully fit within Coast Guard funding, computer, and personnel constraints. They are:

1. Electronic Performance Support Systems and Technical Manuals
2. Interactive Courseware/Computer Based Training (ICW/CBT)
3. Interactive Video Tele-training (IVT)
4. Web Based Delivery

These systems can only yield maximum benefit if they are coupled with a fundamental shift toward performance support and the recognition that different solutions are required for different learning outcomes and environments. In addition to a shift towards performance, the Coast Guard must also obtain multiple benefits from each of these technology-based systems. Using related technologies to simultaneously provide on the job training, serve as training aids in the classroom, provide policy guidance, manage knowledge and improve workforce performance is the type of bang for the buck return on investment the Coast Guard must have.

As an example, the Coast Guard is investing significant effort to develop its capability to deliver synchronous WBT. This technology is typically used when the student does not have to be in the same physical environment as the instructor or classmates but still requires a high degree of interaction with fellow students or the instructor. Commercial tools currently under test and development by the Performance Technology Center enable instructors from resident environments to quickly repurpose their lesson plans, materials and media for delivery via the web. Although WBT is not currently feasible for hands-on skill training (i.e., maritime law enforcement defensive tactics) it is proving to be an excellent method to cost-effectively deliver live training directly to the student at home or at work.

Live WBT modules are built around instructional units comprised of text materials (lesson plans, student guides, handouts), presentation programs (PowerPoint slides), electronic whiteboards, text discussion, audio/video feeds and other related tools. *Synchronous WBT is one of the best buys for the dollar for Coast Guard training and performance support*. Costs are minimal and, unlike CBT and its WBT variants, conversion is rapid and similar in scope/duration to a normal curriculum review. If properly designed, live programs can also be stored for later retrieval in an asynchronous environment.

Cost Benefit Factors and Return on Investment (ROI)

Although travel costs vary based on student source locations, changes in airfares, and other factors, up to two thirds of our available training funding goes directly into travel. On average, it costs approximately $500.00 to send a student to a training enter for one week (travel plus daily cost). Additional weeks are based on a $10.00/day cost while the student is at the Center. This cost factor does not include fixed costs for infrastructure that are specifically tied to students (i.e., barracks and galley operations). ROI calculations are solely based on travel cost recovery although there are significant potential efficiencies and savings if distance delivery enables eventual resident infrastructure reductions.

Other Important Benefits.

Hard travel dollar reductions offer the potential for enormous ROI. That's important, but other harder-to-prove benefits also exist. Just in time training support, hybrid-training systems that effectively join advanced distributed learning systems with resident instruction and performance support, quality of life improvements, and improved manning levels have the potential to have an even greater impact on Coast Guard operations. Live WBT can link professional trainers, type desk and other support sources with the field to reduce the burden on units to prepare for and conduct general military and PQS training (e.g., sexual harassment training, ethics, safety training). It offers trainers and professional support staff the enhanced ability of "bringing in" expert guests into training sessions to improve communications between centers of excellence, the field and the training community. Live WBT is not a panacea, but if applied correctly it can reap immediately, identifiable as well as less tangible benefits.

Resident instruction will continue to be the preferred delivery mechanism of choice when: 1) interactivity requirements are high 2) students need to practice with real equipment or expensive simulators, 3) training results in formal certification. Resident training will become a less critical performance intervention as VRML and haptic interfaces mature, bandwidth continues to develop, and video links become available (IVT, VTC, or WebTV). More knowledge-based, low-level skills and attitude related objectives (i.e., sexual harassment sensitivity) will be executable in a distance learning system.

The commonly held fear that technology will drive a wedge between the student and the staff is misplaced. Our trials indicate the technology offers instructors the flexibility to focus attention, coaching, or mentoring support on the students who need it most. Small groups can be put together based on progress, thereby allowing instructors to focus time on the students who need extra help or coaching.

Measurable Goals and Objectives

The near-term goals of the CGADLP are to develop and assess advanced distributed learning prototypes that exploit existing technologies in order to demonstrate the capability to provide learning on demand (*anytime, anywhere*) that is consistent with stated functional requirements of the WPTS.

The mid-term goals are to research and develop more powerful tools and techniques that significantly improve the cost and learning effectiveness of current learning methodologies.

Longer-range goals are to implement a fully functioning CGADLP that supports the full-range of operational learning needs while increasing the readiness of the force as reflected in the WPTS. Assessments of advanced distributed learning prototypes will conform with widely accepted scientific techniques for determining cost and learning effectiveness relative to traditional education and training techniques. These assessments will be organized and coordinated by the PTC, working closely with G-WTT Staff, and Training Centers.

Where appropriate, results of evaluations will be shared with the public and private sectors. The plan and its goals are compatible with DOD ADL initiatives. Extensive collaboration with DOD will ensure interoperability and cost effectiveness.

Near Term Goals (1 Year)

The near-term goals of the ADL Initiative are to develop and assess advanced distributed learning prototypes that exploit existing technologies in order to demonstrate the capability to provide learning on demand (*anytime, anywhere*) that is consistent with stated functional requirements of the WPTS View. Some of these goals include:

- Development of the management structure to guide ADL implementation
- Implement an Incentives based Distributed Learning Recapitalization Plan
- Revised publications and doctrine instructions to incorporate performance support and just-in-time learning into all publications
- Develop an Afloat Learning Environment Implementation Plan
- Implement an enterprise wide remote access policy
- Conduct analysis of existing resident courses for potential ROI.
- Develop a Media Archiving System

Mid-Term Goals (1-5 Years)

The CGADLP mid-term goals are to research and develop more powerful tools and techniques that significantly improve the cost and learning effectiveness of current learning methodologies.

- Develop the CG Digital Library System
- Establish a CG Modeling and Simulation Center

Long-Term Goals (5-10 Years)

Longer-range goals are to implement a fully functioning CGADLP that supports the full-range of operational learning needs, and increases Coast Guard readiness.

Assessments of advanced distributed learning prototypes will conform with widely accepted scientific techniques for determining cost and learning effectiveness, relative to traditional education and training techniques.

- Develop Virtual Learning Environment (VLE) including prototype development of education architecture, which integrates all training and education.
- Ensure that at least 99 percent of the Coast Guard population will be within 50 miles of a distance learning classroom, home computer, or standard workstation.
- Deliver training, education, and information "on demand" as a career-long continuum to support operational readiness and personal excellence.

Conclusion

The Coast Guard is poised at a unique position in its history in terms of its ability to use technology to develop its people. For the first time, communications and training technology have advanced to the point where Coast Guard people can gain access to the information and training they need to perform their jobs anytime and anywhere.

The CGADLP addresses the needs of the Coast Guard, and incorporates geographically dispersed or mobile learners, afloat learning environments, interoperable platforms and software, integrated adaptive networks, distributed management and support sub-systems, and a positive "learner-centric" culture. Existing schools will continue to be used, as they evolve their capabilities to develop, launch, support, and archive advanced distributed courseware and other hybrid training solutions.

To make best use of the technologically advanced equipment the service is deploying on its boats, ships and aircraft, they must have personnel who are just as technically sophisticated and who can access the information they need to operate and maintain this equipment to its best advantage. The Coast Guard's Advanced Distributed Learning Plan is its response to the challenge of providing the information and learning its personnel expect and deserve as they confront future operational challenges.

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