# Effective, Scalable, Verifiable

## The Power and Application of Blended Learning in Field Security Operations of the Defense Information Services Agency

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### Introduction

For the past 10 years, online educational offerings have been increasing at an exponential rate (Allen & Seaman, 2006). More recently, there has been a convergence of instructor-led training (ILT) with online learning, the appropriate iteration of the evolution of technology, asynchronous teaching and distance/digital learning. As a result, blended learning is assuming an increasingly prominent role in developing and dispersing content, whether in a traditional context, corporate/global setting, or anytime/anywhere situation. The larger environment builds on the increasingly ubiquitous nature of learning and is the

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impetus behind such change. Chief among the efforts stimulating the change in online learning is the Advanced Distributed Learning (ADL) Initiative, launched nearly 10 years ago by the Department of Defense (DoD) in order to "establish a common technical framework for computer and Web-based learning that fosters the creation of reusable learning content as 'learning objects'" (Wisher, 2006, para. 6). "ADL is an enabling technology in the DoD Training Transformation program" (Wisher, 2006, para. 6) and forms the background for the reasons behind creating curricula designed to implement the training policy and advanced application of learning across a massive landscape.

Moving from the macro framework to the more immediate project details involves an understanding of how such learning is comprised and addressed pragmatically (i.e., making it work). This objective is a tall order: the NetOps content delivers a transformational concept to thousands of DoD personnel, comprised of multiple subentities and agencies, in addition to the widely extended DISA audience. It is for this reason especially that the use of a "blended learning" approach is essential (i.e., effecting change on a historic level across a highly complex and disseminated employee workforce). A working definition posits the notion that "blended learning systems combine face-to-face learning systems and distributed learning systems. It also emphasizes the central role of computer-based technologies in blended learning" (Graham, 2006, p. 5). Content that is taken by students—or employee participants in this case—via computers or the Web is hardly new, as creative adaptations and applications are being employed every day and the expansion in this area is growing at an exponential rate. This case study provides a direct application of blended learning in an extensive, distributed environment, employing best practices of instructional design and subject matter expertise for a governmental agency that requires worldwide access to content.

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The content is multilayered, modularized (allowing for either sequential or nonsequential instruction) and includes both mastery of information and the capacity to demonstrate knowledge of the essential organizing concept. Transformation denotes innovation, total change, and reinvigoration. The purpose of the curriculum is to provide high-level input with attention to history, context, function, and policy over three courses, each building on the other and based on successful completion. The case study here emphasizes the design, development, and distribution of the courses through a successful blended and distance learning process delivered through a learning management system, while meeting disparate federal requirements for education, workforce professionalization, and appropriate access (accommodations to allow full participation by all personnel).

## Process

The overarching question addressed was how can a large, governmental agency embed and implement a transformational framework with a large population and across a highly dispersed operation? A new organizational framework was required, one that was strategic and provided a critical infrastructure. NetOps is a "big picture" term that is intended to denote integration of enterprise management, network defense, and content management on a globally integrated scale. It involves a comprehensive strategy whereby Booz Allen Hamilton partners with the Defense Information Services Agency (DISA) to implement a full-scale training effort within the scope of the Information Assurance Technology Analysis Center (IATAC) contract. Booz Allen initiated and continues to develop both ILT courses and a computer-based training (CBT) courseware, resulting in a blended training solution. The project—based on extraordinary collaboration between DISA and Booz Allen team members—literally began as a blank page, with no baseline of knowledge of the concept and has moved to full development in a short span of time.

NetOps is a transformational concept and methodology for operating and defending the Global Information Grid (GIG) that requires unprecedented cooperation among the services, agencies, and personnel. Systemwide collaboration is another way to think of the connection represented by jointness, which refers to a seamless interweaving of interoperable systems, assured security, global information, and high-quality. To successfully train in this environment requires collaboration, communication, and "buy in" across the enterprise.

DISA is a Combat Support Agency (CSA) responsible for planning, engineering, acquiring, fielding, and supporting global netcentric solutions to serve the needs of the senior government leaders, such as the president and the secretary of defense, as well as other DoD components, under all conditions of peace and war. Through the FSO, information assurance training ensures the availability, integrity, identification, authentication, confidentiality, and acceptance of information and information systems within DoD information systems and computer networks.

This is the core of implementing the transformation systemwide. The result is that a very large organization can effectively provide global netcentric solutions for a dispersed population of combat and support personnel. The designated core missions of DISA are communications, joint command and control, defensive information operations, combat support computing, and joint interoperability support.

The challenge, therefore, is to turn a large and complex organization with approximately 7,000 employees in a new direction and to embrace a new functional philosophy. Similar to an ocean liner changing course, it takes a strong and persistent effort to effect the transformation, the expected outcome of the immense training program. The solution is to provide expertise and a consistent message through delivery of the content via multimedia technology and digital distribution, ensuring employee knowledge and awareness. With such a complex organization, the transformational concept is an extraordinary goal; for that reason, even though the training content may be nonsequential, to disseminate and embed this concept throughout the culture, the first course, NetOps: An Overview, is required of all employees.

To that end, DISA has engaged Booz Allen's instructional design professionals in developing a highly focused, systematic approach based on extensive expertise with training and education, human information processing, communications technologies, and instructional system design (ISD). Using an industry standard instructional and courseware development

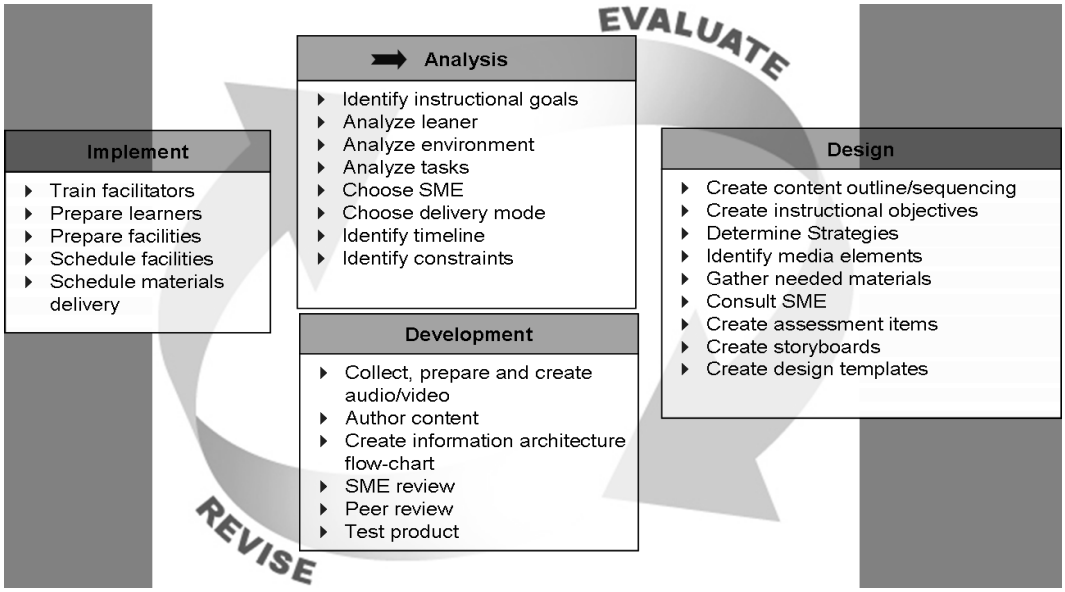


Figure 1. Booz Allen's development process.

process, ADDIE (Analysis, Design, Development, Implementation, and Evaluation), the Booz Allen team was able to combine advanced technologies with sound learning and educational principles to establish a learning structure that best meets the training requirements of NetOps organizations worldwide. A detailed explanation of each step in the Booz Allen development process is depicted in Figure 1.

This process, along with Booz Allen's expansive involvement and Subject Matter Expertise (SME) in the arenas of NetOps implementation and support, has allowed the development of a tailorable and scalable continuum of NetOps training. As a result, the content and instructional flexibility of the curriculum fits the experience, maturity, and ability of the DoD audience, including DoD warfighting, intelligence and business domains, Combatant Commands (COCOMs), Services, and Agencies, and Coalition or multinational organizations.

The protocol from the beginning was based on partnering with the client team, creating a type of "no walls" experience, whereby both groups leverage intellectual capital and areas of strength to aggressively accomplish an exceptional task. When designing the learning offering, the team considered the learning tasks, learner preferences, content hierarchy and organization, media selection, and usability. In order to apply best practices and reach the large and extensive client base involved, designers employed blended and Web-based learning, self-paced simulation, Sharable Content Object Reference Model (SCORM) conformance, Section 508 compliance, and other open standard formats. This partnering requirement, especially, is crucial to the agency in meeting requirements, timelines and achieving training metrics and interoperability with all training systems. On a related note, due to the "depth of bench" capacity and capability in both design and technology, the training is scalable and can reach the large "n" or number of training subjects required for the project.

SCORM is a common technical framework for Web-based learning content; most importantly, it provides the specifications to create sharable, reusable content.

SCORM is needed to standardize how to create reusable content and how to launch and track directed learning experiences, most often from a learning management system. The power of SCORM standards is in the reusability, accessibility, and interoperability of content across many learning contexts and systems. The NetOps: An Overview CBT implements SCORM version 1.2 guidelines, including metadata for content objects and the ability to navigate between and among the topic-level sharable content objects (SCOs). In addition, the course has built-in SCORM-conformant values to track student participation from beginning through completion. The use of SCORM is critical to this effort due to the required flexibility of the content as well as the need to provide this content to several DoD agencies for training, policy decisions, and Continuity of Operations (CONOPS) development and review.

With special attention to the Section 508 requirement, it is important to specifically note this ensures equal access through the appropriate use of information technology. The U.S. Department of Education is a thought leader in the realm of Section 508 compliancy. The NetOps: An Overview course has been approved by the Department of Education's Assistive Technology Program as a product that ensures minimum accessibility for individuals with disabilities. The department has established Requirements for Accessible Electronic and Information Technology (E&IT) Design in order to support its obligations, under Sections 504 and 508 of the Rehabilitation Act of 1973, 29 U.S.C. 794 and 794d. This specifically proscribes the obligation and process to acquire accessible electronic and information technology and applies to this project in terms of evaluating and deploying hardware and software.

## Process and Outcomes

Mendenhall (2007) points out that distance or online learning is becoming ubiquitous and that learning objectives and goals are accomplished with the same expectations and achievements for both instructor-based and online learning. In this case, the learning goals of the training are specifically linked to the transformational concepts; success is measured in terms of how transformational principles impact everyone within the agency (attitude, function, and capability) and everything, including support for military personnel and adaptation to a variety of situations. The courses expand employees' knowledge on how to react in each high-level and strategic situation:

- **Operational Accountability:** NetOps illustrates that what one person does affects many, and the training emphasizes preparation for any situation that arises and the interoperability to provide the right information to the right person, just in time.
- **Innovative, Integrated Solutions Supporting the Warfighter:** That all actions are coordinated to ultimately support the Warfighter and NetOps is the framing concept for this core mission and value.
- **Operational and Strategic Agility:** With early and integrated knowledge of the commander's intent, military personnel can increase their rapid response capability.

Booz Allen has developed three courses that comprise the NetOps curriculum: NetOps: An Overview; NetOps: Applied to GIG Operations; and NetOps: Policy Guidance and the DoD Enterprise. These courses take a blended learning approach, complete with comprehensive materials needed to support course delivery, including animated slides for visual representation of the concepts, and instructor guides that incorporate a script for the instructor, amplifying notes at appropriate locations in the instruction, discussion points, and references. In addition, each student

receives a student guide, which provides a thumbnail of all slides to follow along with the instructor, ample space for note taking, footnote references, an acronym list, and several reference documents including salient policy and relevant framing directives.

The cornerstone of the NetOps courses is the inclusion of scenario-based learning events that connect students to a real-world NetOps experience. The scenario—which is entirely unique and embedded in all three courses—is completed at the beginning of the course and becomes the framework for concepts subsequently taught. In addition to this scenario, the courses are designed to maintain student engagement with tabletop activities and collaborative discussions. Student comprehension and learning objective mastery is assured throughout the courses through thorough module reviews and confirmed via a final cumulative assessment. A course evaluation encourages students to provide feedback for subsequent course improvements. As a result, there is a culture of evidence and a built-in performance improvement process, both goals of the training project and consistent with the transformational tenets.

To better meet the needs of DISA's distributed staff, Booz Allen team members developed a strategy to add the online format and combine it with instructor-led sessions, resulting in both asynchronous and synchronous environments with the same course material reaching more people. Facilitators for the computer or online-based courses, Booz Allen's SME instructors, are fully aware of the practices and protocols regarding facilitating learning in a blended-learning environment. Learning outcomes are the same as those for the site-based, instructor-led delivery; however, new learning modules were developed for the courses to reflect the updated modality and format (e.g., learning activities). For example, as Figure 2 illustrates that students agree and strongly agree that instruction and content for these courses are very important and have a direct impact on the learners positive experience.

Over 2,500 students across the DoD have received the NetOps curriculum using both computer-based and mobile training teams—a blended learning pro-

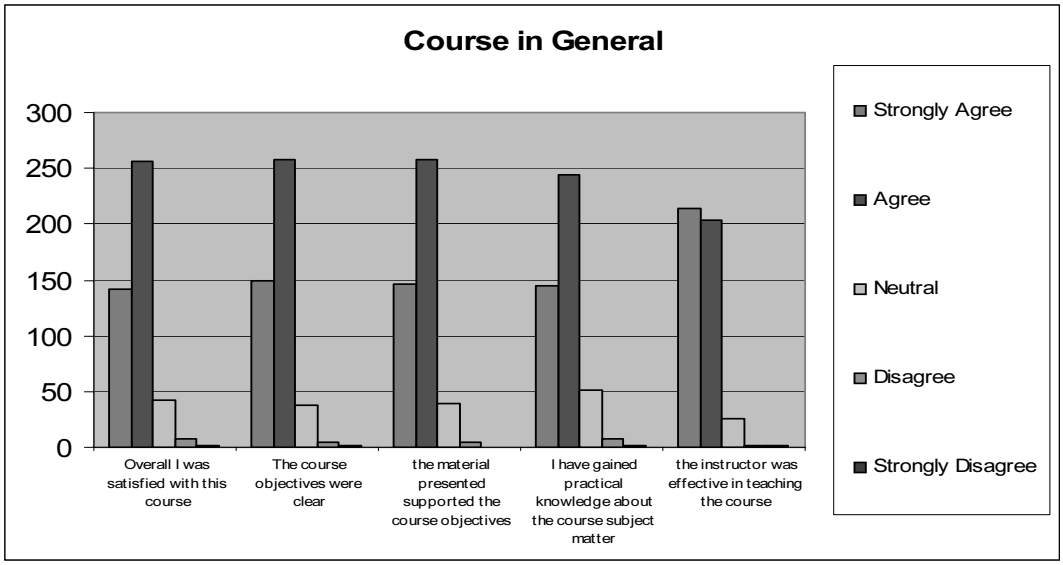


Figure 2. Student evaluation feedback, NetOps: Applied to GIG operations.

cess—hosting classes at each COCOM and various DISA external agencies. The NetOps: An Overview course has been fully converted into a computer-based course that is interactive and incorporates audio, flash animations, progress checks, and a comprehensive assessment to provide students with an introduction to GIG essential elements, functions, roles, responsibilities, and benefits. The course is hosted on DISA's internal Web site. This blended program has become a de facto additional geographic location that can be deployed regardless of place and time, thereby ensuring maximum access and participation by all DISA employees.

Students for NetOps range from manager and planner, such as senior level military personnel, to in-training apprentices and civilian contractors. The courses ranges from two to four hours and students can participate in the blended learning environment by taking the courses and modules from the instructor and online. An example of demographic information by position is noted in Figure 3.

## Lessons Learned

The major lesson of the case is that an extraordinary challenge to implement a required transformational process can be accomplished using the power of blended learning. Takeaways in applying advanced distributed learning and blended learning to effect entity transformation include the following:

1. From the beginning, work with clients to develop content that will be taught both online and onsite
2. Use the "pilot" process both internally and externally at each stage—then, incorporate those lessons into the next iteration
3. Pay attention to student/participants, both in the pilot stage and through ongoing evaluations
4. Listen to instructors to quickly incorporate changes, to update and add relevant content and employ new tactics (for scenarios) and strategies (for online learning)
5. Provide leadership and expertise—walk the walk and talk the talk—con-

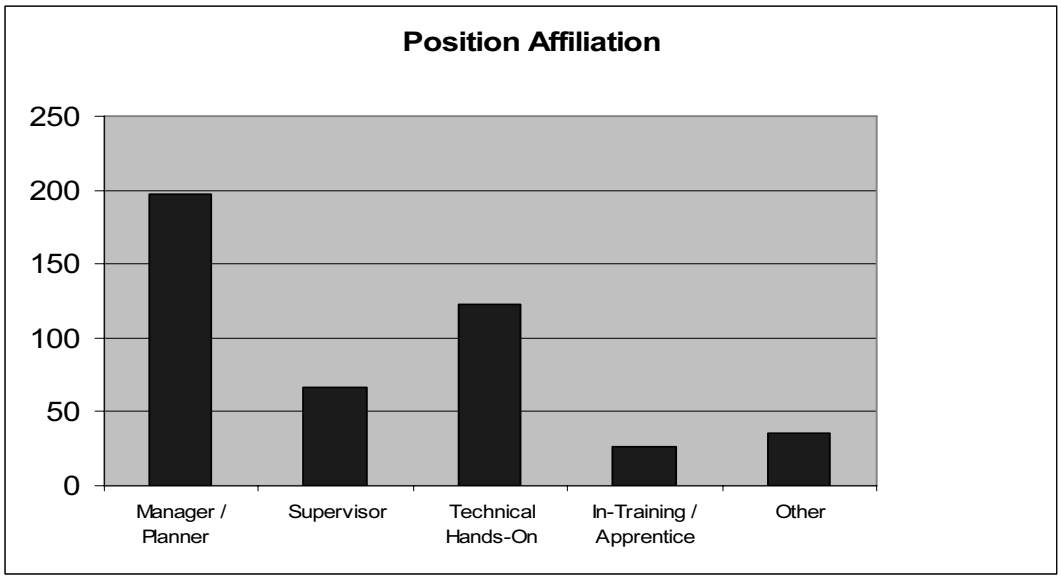


Figure 3. Demographics information by position, NetOps: Applied to GIG operations

sistently throughout the entire process, from developing content to implementing excellence in instructional design

## Conclusion

Booz Allen Hamilton has developed a three-course curriculum for DISA that is in place and currently being delivered via blended learning. This blended learning process will eventually impact an extraordinary number of military personnel, nearly 7,000. Using blended learning methods, including instructor-led and asynchronous online learning, is the primary way to achieve success in accomplishing this goal. DISA and Booz Allen will continue to partner effectively together to introduce innovation and flexibility, while being responsive to meeting ongoing challenges and determining next steps. The content and its deployment will, therefore, remain scalable, SCORM conformant, and agile in providing blending learning content, instructional design and technological modalities.

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