Measuring Distance Learning Workload: The Army Model for DL Instructor Hours

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ABSTRACT

The vision of U.S. Army Training and Education is expressed in the new Army Learning Model, a paradigm shift defined in the Army Learning Concept for 2015. Army Training and Education was traditionally defined as either classroom or distance learning with a clear distinction in the use of instructor led activities. The new Army Learning Model focused more attention on the blending of these two modalities.

For the Army, a major advantage of blending classroom with distance learning is efficiency of scale. On classroom presentation for twenty can be made to reach a larger audience of 40 to 60. But how large is too large and what are the effects in terms of teaching and learning effectiveness? Obviously, such a strategy has major advantages in reducing the resources needed, but what are the tradeoffs?

The Army Distributed Learning Program has been producing asynchronous courseware for a number of years but has failed to define a design strategy for using that same content in the classroom to supplement a synchronous presentation. This strategy must include a method for resourcing the course with instructors in the classroom and off-site if needed.

This talk will describe the process the Army is following in developing the Course Resource Model for Resident and Non-resident Learning Activities such as collaborative learning to engage learners using digital learning content, relevant operational scenarios, and blended learning approaches. Using a research based approach and a quantitative model, the Army plan relooks the way in which distance learning is resourced by instructional methodology. This approach provides a well documented structure for planning and staffing of instructors as well as for developers of distance learning content.
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ABOUT THE AUTHORS

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INTRODUCTION AND PROBLEM STATEMENT

In the September 2011 report to Congressional Committees, the Government Accountability Office issued its performance audit, results, and recommendations for Actions Needed to Assess Workforce Requirements and Appropriate Mix of Army Training Personnel (U.S. Government Accountability Office, 2011 September). The audit was conducted at the request of the Training and Doctrine Command (TRADOC), the Army's proponent for institutional training and education for 32 schools located on 15 different installations throughout the continental United States. Central to this report was the model used to determine the time an instructor spends with the learner in both resident and distance learning.

The Instructor Contact Hours (ICH) model has not changed since 1998 and does not properly address the influence of technology in the classroom and in the delivery of distance learning. As a result, the Army lacks sufficient data for "determining the appropriate number and mix of personnel to serve as instructors, training developers, and training support personnel to execute its training mission" (p.17). The purpose of this paper is to explore the background and history of the role of the instructor in military training and offer a resourcing tool to assist in determining the appropriate number of instructors needed for distance and blended learning.

Background

As technology continues to influence the landscape of web-based distance learning, the role of the instructor has to consider the workload associated with this phenomenon. The struggle for the correct balance of web-based distance learning and face-to-face classroom learning, within the blended learning model, has challenges associated with providing adequate time allotment for instructors, both inside and outside of the physical classroom. The supposed cost-savings and flexibility that web-based distance learning offers, may come at a high price in terms of overwhelming even the most seasoned faculty member. In the military services, in particular, where instructors serve short terms, usually no more than two years, the online facilitator may not be properly prepared for the time that is needed to effectively teach a web-based distance learning course. Taking this thought one step further, one has to consider what constitutes a correct mix of web-based and face-to-face instruction in a blended learning environment. How much time is each component allotted? How much time should the instructor spend on each component for effective learning to occur? How much money will the proponent center and school allow for this program of instruction? These are just some of the questions that have recently come about in the United States Army's training and education programs.

The US Army, in particular is currently transitioning from a face-to-face, instructor-led learning environment, to a blended model that incorporates face-to-face with web-based distance learning in a learner-centric, context-based, collaborative, problem-centered model, to develop the 21st century Soldier. In doing so challenges are being encountered with blending the current courses, especially when it comes to measuring the distance learning workload of the online instructor; this literature review looks to address these challenges and work with others who face similar circumstances, so that possible solutions and current best practices in online education can be considered.

THE ARMY'S TRADITIONAL SYNCHRONOUS AND ASYNCHRONOUS DISTANCE LEARNING

The "traditional" classroom consisted of a brick-and-mortar building, four walls, a door, some desks and a chalkboard. The Army used this traditional setting for years for its institutional training, excluding most collective and unit training. The face-to-face nature of the traditional classroom is considered a synchronous environment, where the instructor, students, and ensuing activities take place, live, on-location, real-time, within these physical walls.

The military in general has also had a long history of asynchronous learning. This is where students are in

varied locations, away from the instructor and other fellow students, not dependent upon a set schedule, usually by means of self-paced lesson completion; otherwise known as the correspondence course. This paper-based system was used successfully, by all branches of our military, for approximately one hundred years (Duncan, 2005). Until the dawn of the computer age, it remained a standard system of lesson booklets that were mailed out, completed, and then returned for course credit. For the Army, this process was known as the "yellow books", a reference to the color of the jackets used in publishing the courseware.

Distance learning, or DL, as we know it now, is also asynchronous learning, self-paced by the learner, though its method of delivery became via computer and/or internet connectivity. Over the past twenty years, research has shown that abandoning the classroom, in favor of an all-asynchronous method of instruction, has fallen short on meeting the needs of the students (Babb, Stewart & Johnson, 2010). Student perceptions of satisfaction with courses, and actual test scores have shown a blended learning method, one which uses both synchronous and asynchronous learning, has the best results with student satisfaction, higher test scores, and overall efficacy of learning the content presented within the course (Lei & Gupta, 2010).

As distance learning morphed from a paper-based correspondence format to a technology-driven system of delivery, the United States Army, as well as the other services, followed this trend (Duncan, 2005). Defining and refining exactly "what" distance learning was to become, took years. Even now, as technology becomes savvier and research has had time to pan out the results of the past, distance learning has become more of a hybrid, blending synchronous face-to-face class time with asynchronous web-based distance instruction. For this reason, the US Army has yet again been faced with questions that must be answered in order to serve the needs of its fighting force. What is the correct blend of synchronous/asynchronous learning and how do we adequately staff this model, given the increased time commitment of the instructor when engaged in online teaching (Conceicao & Lehman, 2010).

The traditional role of the face-to-face instructor, in the new hybrid model, needs to be adequately staffed, while still allocating time for facilitating the technology-driven parts and pieces of instruction. In the past a simple formula was used by the Army for calculating face-to-face instruction time ("Memorandum for see," 2005). The model was simple because the format was based on direct instruction methods inside of a brick-and-mortar school house. The instructor gave a demonstration or lecture with the students being physically present. This gave a somewhat simple calculation based on criteria that were easily observable and countable. When you consider all of the non-observable, not easily counted criteria of today's technology-driven model, calculations become difficult (Erlich, 2003).

Taking a closer look at the more recent past, the Army used distance learning to present web-based distance learning modules to students before they entered a "resident" brick-and-mortar classroom. From this pattern an instructor resourcing model emerged that differed somewhat from the traditional face-to-face model (Duncan, 2005). This model had prerequisite work done online prior to physical attendance. Usually a lesson or two, consisting of a number of modules, was taken by the student independently. The time commitment on the part of the instructor was minimal. Until the student entered the physical classroom, the instructor's time was not considered, or minimally tallied ("Memorandum for see," 2005).

Best practices in web-based distance learning support a blended approach where online work is done before and during the face-to-face physical classroom (Wallace, 2010). As a use case, for workload calculation purposes, a fictitious six week course will be measured. The first three weeks of the course would take place online, with an instructor-in-the-loop. The last three weeks of the course would have students attend two whole days per week, while concurrently participating in online structured activities, with the same instructor-in-the-loop that is also the classroom teacher. Using this use case may shed light on some bright spots and ideas, as well as challenges.

BLENDED LEARNING AND THE ARMY LEARNING MODEL (ALM), THE NEW PARADIGM OF DL

The Army Learning Concept 2015 does not focus on any particular technology, but rather focuses on the opportunities presented by dynamic virtual environments, by on-line gaming, and by mobile learning. It speaks of access to applications, the blending of physical and virtual collaborative environments, and learning outcomes.

-Martin E. Dempsey, General, United States Army

Since its inception, the Army has used strategic plans which outline and guide missions and objectives, over a given period of time. The current plan used for educating and training Soldiers is called the Army Learning Model (ALM), which is based on a document

called the Army Learning Concept 2015. There are several key concepts defining this model. The need to provide Soldiers and leaders "relevant, tailored, engaging learning experiences" throughout their military career, "that is not location dependent, but accessed at the point of need," are at the crux of the concept ("The US Army," 2011). It also addresses the need to "develop adaptive, thinking Soldiers and leaders capable of meeting the challenges of operational adaptability in an era of persistent conflict" ("The US Army," 2011). The life-long learning, critical thinking, adaptable Soldier competencies rely on a robust technology-leveraging training and education program.

The ALM can be seen as an instrument that will further fuel a paradigm shift in the way technology, and face-to-face resident training experiences are leveraged in today's military classroom. All course proponents, schools and organizations within the Army, that serve the training and education needs of the active and reserve components, as well as civilian education, are tasked with reducing (or eliminating) instructor-led slide presentation lectures, in favor or using a blended approach (TRADOC Pamphlet 525-8-2, 2011). This blended approach will incorporate technology-delivered instruction with the face-to-face classroom component, before and/or during the course itself. The Army refers to this shift as replacing the "sage on the stage" with the "guide on the side". Research continues to support the blended learning model, as long as the blended learning is part of well thought out strategy that accomplishes the intended objectives while meeting the needs of the students. If done correctly, blended learning will accomplish all it sets out to do; however, if done incorrectly, it can be detrimental to the program of instruction (Wallace, 2010). This is where a correct mix of blended learning is important. Wallace also states that experimentation may have to take place in order to find this correct mix.

So what is the correct mix for Army purposes? As stated earlier, not only is getting the correct mix of blended learning components an important facet of effective distance learning, it is important to make sure those components do not overwhelm today's online instructor.

Defining a Design Strategy for Blended Learning that Can Best Suit the Army

While defining a strategic plan for training and educating the fighting forces carries out higher-level processes, defining a strategy for blended learning at the classroom-level has been daunting. Academia struggles with the correct mix of classroom-level blended learning seat-time (or computer-time) strategies as well (Oh & Park, 2009). In academia, a semester (or quarter), is used to designate the length of a course. Course credits are granted using this model. Accreditation and reaccreditation (self-studies) are delineated by this consistent time frame (Blumenstyk, 2012). The Army, however, does not use a semester or quarter. The time period used for training or education is based on many factors, such as one's rank, military occupational specialty or intentional direction of study (Gaddy, 2000). For example, initial entry training Soldiers, logistics officers, and aviation mechanics, can have varying lengths of training. Other Army professionals, such as lawyers, chaplains and physicians, attain their education from accredited colleges and universities before joining military service. Given these occupational variations, the length of an Army training program can vary.

Resourcing the Blended Learning Classroom – The Use Case

The Army is using a model for blended learning derived from an early attempt (2007) to integrate DL and classroom training to support the Army Force Generation (ARFORGEN) cycle. ARFORGEN is the Army's process for meeting the requirements of its commanders by synchronizing the building of trained and ready force. The cycle allows time for soldiers to spend more time at home after returning from conflicts by using distance learning to supplement face to face time. Ironically, the model was called the New Army Learning Model (Markley, 2007). The model included Phase 1: DL at home station and included diagnostic testing and common core task training; Phase II: Classroom Instruction; and Phase III: DL at the Unit and included job aids and reach back via technology. With few exceptions, the New Army Learning Model of 2007 and the Army Learning Model of 2011 are close in concept. The major differences between the two are in the demands made on the instructor and in resourcing the blended classroom.

Table 1. ARFORGEN Phases

Period	ARFORGEN	Activities	Modality
Phase 1	RESET/TRAIN	Training and education at home station	Web-based Instructor in the loop
Phase 2	READY	Resident TDY or PCS	Face to face instruction with DL sessions in the classroom
Phase 3	AVAILABLE	Unit training	DL practical exercises, gaming, simulations in the lab while awaiting deployment

To accommodate the presentation, we are using an interactive .pdf file to assist in resourcing this blended learning course. Again, for calculation purposes, a six week program will be considered and broken down into two three-week blocks. The first blended learning block will be online, with an instructor-in-the-loop, while the last three weeks will have students attending a face-to-face classroom, twice a week while continuing to maintain online presence with the same facilitating instructor.

Instructor Contact Hour (ICH)

The Army ICH is based on the course version academic time. An ICH represents one instructor work hour during which an instructor is in contact with a student or students conducting, facilitating, or performing instructor duties such as:

- conducting seminars
- conducting conferences
- leading discussions
- performing demonstrations
- conducting exercises
- monitoring testing
- performing critiques

Optimum Class Size

The Army defines the Optimum Class Size (OCS) as the number of students that should be trained in a group. This is a number that is more than the minimum that can be trained and less than the maximum. For the Army the OCS can and does change by learning objective as the difficulty and safety of each objective is reviewed and a determination is made to adjust the OCS. Studies have shown that approximately 16 students is an optimum number for blended learning (Tomei, 2012). Any more than a dozen or so students can subject a web-based instructor to a heavy, if not overwhelming, workload. Also, the perceptions of quality, value and satisfaction by students, is negatively impacted in a blended class size that is too large for effective communication with the instructor (Babb, Stewart & Johnson, 2010).

Other Factors

Instructor Manpower Staffing Standard System (MS3) formulas compensate for other types of instructor work hours, to include the instructor provided support in the:

- analysis
- design
- development of training products
- preparation for instruction
- conduct of pre-entry testing
- conduct of remedial training/testing
- grading tests
- student counseling

Student Groups

The number of student groups is computed by dividing the OCS by the optimum number of students to be trained in a group. This number is provided by the training developer as each learning objective is developed.

The Calculation

The ICH for one Program of Instruction (POI) file or lesson is calculated by multiplying the number of academic hours times the number of student groups, times the number of instructors required per group. Formula: lesson hours by event (lesson or activity) x number of groups x number of instructors per group = ICH earned for that block of instruction.

The Use Case

Week one through the end of week three are online, with an instructor-in-the-loop. The content would be "foundational" because it is a beginner's course. This foundational information would allow the students to come into the face-to-face classroom with a basic frame of reference regarding the topic of study.

This lower level of learning will set the stage for higher levels of learning, and critical thinking, during the practical exercises and activities used in the physical face-to-face classroom.

A pre-test can be taken, by the student, at any time to gauge their understanding of the topic. The results of this pre-test would be transmitted to the instructor for base-line purposes (not for a grade).

Several self-paced online Interactive Multimedia Instruction (IMI) modules would be taken by the students during the first three weeks. These IMIs would have checks on learning with immediate feedback on incorrect answers. They would also be the topics used for threaded discussion. Two threaded discussions would take place each week, based on an applicable topic/objective. For instructor workload purposes, we will look at the communication responsibilities associated with this use case for online blended learning.

Table 2 - The Example Use Case: 16 Army Soldiers in a Six-Week Blended Learning Course

Description	WK 1	WK 2	WK 3	WK 4	WK 5	WK 6
Pretest - Gauge the students understanding of the topic. The results of this pre-test would be transmitted to the instructor for adapting the instruction (not for a grade)						
Online with instructor in the loop – Content led or facilitated by instructor						
Foundational levels of learning- This foundational information would allow the students to come into the face-to-face classroom with a basic frame of reference regarding the topic of study.						
Interactive Multimedia Instruction - These IMIs would have checks on learning with immediate feedback on incorrect answers.						
Threaded discussion - Two threaded discussions would take place each week, based on a topic/objective.						
Higher levels of learning - Critical thinking, application and synthesis during the practical exercises and activities used in the physical face-to-face classroom						
Interactive Multimedia Instruction - These IMIs would have branching based on instructional cues.						

Blue = Pre-Resident Phase: Asynchronous Online Learning with Instructor-In-The-Loop

Green = Blended: Threaded Discussion is Asynchronous but takes place throughout 6 weeks

Yellow= Resident Phase: Face-to-Face classroom time combined with online activity

NOTE: Each threaded discussion will account for 2 or 6 minutes of instructor time.
2 discussions per week, multiplied by 3 weeks = 6 discussions x16 students = 96 discussion threads
96 discussion threads x 2 minutes per response = 192 minutes (or 3.2 hours) – or –
96 discussion threads x 6 minutes per response = 576 minutes (or 9.6 hours)

Each email will account for 2 or 6 minutes of instructor time. At a minimum there will be 2 emails at the start of the class, 2 per week (2x3=6), and 2 at the end 2+6+2=10

Example: Ten email for the first three weeks.
10 emails x 16 students = 160 responses
160 responses x 2 minutes per response = 320 minutes (or 5.3 hours)
160 responses x 6 minutes per response = 960 minutes (or 16 hours)

This means that in threaded discussion time, combined with an approximate number of emails, for the first three weeks of the six week blended class, gives us numbers that show the workload patterns of just the communication aspect of an online instructor.

3.2 hours + 5.3 hours = 8.5 hours (For two minute responses per thread and email)
9.6 hours + 16 hours = 25.6 hours (For six minute responses per thread and email)

These time commitments are estimates of direct student communication and do not include announcements posted on the course page, assignment instructions, upcoming events, coursework that is due, any reminders, and other "general" communications done online.

ONE-SIZE-FITS-ALL PERILS

The Army Learning Model is asking training developers to convert [most] classroom experiences into blended learning to foster collaborative problem-solving and critical thinking (TRADOC, 2011). Now that numbers have been appended to a use case, one can see there may be many variations in using this model. If something happens during the course, necessitating more email traffic, the numbers would show a greater communication commitment. If the course has more content, the six week use case might stretch out to an eight or twelve week course. If the course had a diverse audience, some students might need more direction from the instructor. As you can see, one-size-fits-all perils can ensue as the variables change.

THE WAY FORWARD

Organizational requirements for ARFORGEN, current economic conditions and enhances in technology will affect the way the Army trains and educates its future force. At this time the Army needs to focus on finding ways to align its current courseware to Army Learning Model standards. The focus will continue to be on flexible learning, anytime, anywhere and the use of a blended model that is facilitated by an instructor-in-the-loop. The ability to maintain acceptable levels of readiness, in an era of declining resources, by providing learning at the point-of-need, is critical to Soldiers and the mission they are set out to execute.

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