Operationalizing the Army Learning Strategy in Unit Collective Training

A Monograph

by

MAJ Andrew P. Jenkins
US Army

School of Advanced Military Studies
US Army Command and General Staff College
Fort Leavenworth, KS

2018

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	**2. REPORT TYPE**	**3. DATES COVERED** *(From - To)*
24-05-2018	Master's Thesis	JUN 2017 – MAY 2018

4. TITLE AND SUBTITLE
Operationalizing the Army Learning Strategy in Unit Collective Training

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Major Andrew P. Jenkins

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Advanced Military Studies Program

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT
The US Army created the *Army Learning Strategy* in response to the anticipated demands of dynamic and complex future operational environment as described in the *Army Operating Concept: Win in a Complex World, 2020-2040* (*AOC 2020-2040*). The strategy describes how the Army should evolve its conceptualization, delivery, and management of all learning opportunities across the force, including both training and education. The strategy calls for the effective application of learning theory in both training and education, through learning science principles and instructional techniques. It does not, however, specify which learning theories or concepts the Army should apply. To apply this new strategy in collective training occurring in the operational force, training methodologies should be informed by learning theories that enable maximum transfer of knowledge.

This monograph examines the applicability of adult learning theory in unit collective training. Two case studies, the mobilization for World War II and the "Training Revolution" of the 1970s and 1980s, provide background and evidence for analysis of linkages between learning theories, training methodologies, and operational concepts. Analysis of these case studies illustrates how learning theories can inform unit training to achieve specific learning outcomes. This monograph further synthesizes the findings from the two case studies and the training outcomes required by current doctrine and describes how additional learning theories can complement and improve training methodologies. These findings offer insight for planners and leaders to develop unit training methodologies to achieve maximum knowledge transfer.

15. SUBJECT TERMS
Training; Education; Learning; Training Management; Mobilization; Training Revolution

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			Major Andrew P. Jenkins
(U)	(U)	(U)	(U)	46	**19b. TELEPHONE NUMBER** *(include area code)*

Monograph Approval Page

Name of Candidate: MAJ Andrew P. Jenkins

Monograph Title: Operationalizing the Army Learning Strategy in Unit Collective Training

Approved by:

_____, Monograph Director
Mark T. Calhoun, PhD

_____, Seminar Leader
Keith Pruitt, COL

_____, Director, School of Advanced Military Studies
James C. Markert, COL

Accepted this 24th day of May 2018 by:

_____, Director, Graduate Degree Programs
Robert F. Baumann, PhD

Abstract

Operationalizing the Army Learning Strategy in Unit Collective Training, by MAJ Andrew P. Jenkins, US Army, 46 pages.

The US Army created the *Army Learning Strategy* in response to the anticipated demands of dynamic and complex future operational environment as described in the *Army Operating Concept: Win in a Complex World, 2020-2040* (*AOC 2020-2040*). The strategy describes how the Army should evolve its conceptualization, delivery, and management of all learning opportunities across the force, including both training and education. The strategy calls for the effective application of learning theory in both training and education, through learning science principles and instructional techniques. It does not, however, specify which learning theories or concepts the Army should apply. To apply this new strategy in collective training occurring in the operational force, training methodologies should be informed by learning theories that enable maximum transfer of knowledge.

This monograph examines the applicability of adult learning theory in unit collective training. Two case studies, the mobilization for World War II and the "Training Revolution" of the 1970s and 1980s, provide background and evidence for analysis of linkages between learning theories, training methodologies, and operational concepts. Analysis of these case studies illustrates how learning theories can inform unit training to achieve specific learning outcomes. This monograph further synthesizes the findings from the two case studies and the training outcomes required by current doctrine and describes how additional learning theories can complement and improve training methodologies. These findings offer insight for planners and leaders to develop unit training methodologies to achieve maximum knowledge transfer.

Contents

Acknowledgements

I would first like to thank those who inspired me to attend this school. As a junior captain, I was privileged to serve in the G5 of the 101st Airborne Division (Air Assault) and was surrounded by some of the smartest officers I have ever met. The skills and intellectual capacity that they displayed inspired me to want to be like them, and I hope to continue to live up to the example that they set. Additionally, I would like to thank those here at Fort Leavenworth that made this monograph possible. Specifically, Dr. Jay Van Der Werff of Army University who offered advice and encouragement in the initial framing of this work, and Mr. Russell Rafferty who provided a tremendous volume of data for me to research. Finally, I'd like to thank my dog, Howie, who spent countless hours keeping me company as I wrote this, but sadly was not able to see me finish.

Acronyms

ADP	Army Doctrine Publication
ADRP	Army Doctrine Reference Publication
AGF	Army Ground Forces
AOC	Army Operating Concept
ARTEP	Army Training and Evaluation Program
BCTP	Battle Command Training Program
CTC	Combat Training Center
FM	Field Manual
FORSCOM	Forces Command
FSR	Field Service Regulation
GHQ	General Headquarters
MACV	Military Assistance Command – Vietnam
MCTP	Mission Command Training Program
MILES	Multiple Integrated Laser Engagement System
PME	Professional Military Education
TRADOC	Training and Doctrine Command

Introduction

The US Army published the *Army Learning Strategy* in July 2017 to "establish the conditions and highlight the necessary resource investment towards the creation of a culture within the US Army that supports a career-spanning learning environment." The Army created this strategy in response to the anticipated demands of dynamic and complex future operational environment as described in the *Army Operating Concept: Win in a Complex World, 2020-2040* (*AOC 2020-2040*). To prepare forces to meet these future challenges, the Army has acknowledged that it must dramatically increase its ability to develop and improve the cognitive capabilities of soldiers and leaders at all levels.[1]

The *Army Learning Strategy* describes how the Army should evolve its conceptualization, delivery, and management of all learning opportunities across the force, including both training and education. The strategy calls for the effective application of learning theory in both training and education, through learning science principles and instructional techniques. It argues that by doing so, the Army will find opportunities to blend both training (preparation for known tasks) and education (strengthening the intellectual ability to solve new or unfamiliar problems) into an integrated continuum. The strategy calls upon all Army leaders to actively create optimal learning opportunities within their formations. To accomplish this strategy, leaders will need proficiency with learning science principles and organizational commitment to a learning culture, which should result in stimulated learning, thinking, and skill retention. The *Army Learning Strategy* does not, however, specify which learning theories or concepts the Army should apply.[2]

---

[1] US Department of the Army, *Army Learning Strategy* (Fort Leavenworth, KS: Army University Press, 2017), 4-6, quotation on 4; US Department of the Army, Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, *The US Army Operating Concept: Win in a Complex World, 2020-2040*. (Washington, DC: Government Printing Office, 2014), 31-35.

[2] US Army, *Army Learning Strategy*, 4-6; US Department of the Army, Training and Doctrine Command (TRADOC) Pamphlet 525-8-2, *US Army Learning Concept for Training and Education, 2020-2040* (Washington, DC: Government Printing Office, 2017), 8-24.

The learning sciences have contributed much towards improvement in the US Army's institutional training and education efforts in recent years, but training doctrine for the operational force has changed little. Training methodologies should reinforce operational doctrine and concepts while supporting organizational learning across the force. The Army has previously revised training methodologies when transitioning to new operating concepts. The most well known of these revisions took place during the Training Revolution of the 1970s and 1980s. For many reasons, the Army changed its approach to training while also changing its operating concept. This enabled units to employ the new operating concept quickly and effectively. The Army has changed little in its training doctrine since then, but it now increasingly stresses a need to operate differently in the future. Learning theory can provide a basis for designing training that will successfully prepare units for the new operating concept.[3]

To manage the development of its leaders, the Army uses a structure of domains in which training and education occur: operational, institutional, and self-development. Army doctrine notes that training and education occur in each of these three domains, but to varying degrees. The operational domain primarily involves experience and training. In the institutional domain, education takes primacy. The Army University, part of the institutional domain, has recently begun to make sweeping changes to ensure schools across the Army are using evidence-based practices for instruction. However, these changes can only be expected to have a small effect on a leader's development over the course of a career. For example, an armor officer taking command of a battalion has spent as few as 20 months in resident Professional Military Education (PME) at that point in the officer's career—4.5 months in the Armor Basic Officer Leadership Course, 5.5 months in the Maneuver Captain's Career Course, and 10 months in the Command and General Staff Officers' Course. With less than 2 out of 17 years spent in PME, this dearth of institutional

[3] US Army, *Army Learning Strategy*, 8-17; Ralph Doughty, Linton Wells, and Theodore C. Hailes, *Innovative Learning: A Key to National Security* (Fort Leavenworth, KS: The Army Press, 2015), 35-50.

education seems unlikely to provide the knowledge necessary for a battalion commander to win in the complex world described in *AOC 2020-2040*.[4]

Since an officer spends a large majority of the pre-battalion command years in the operational domain, a greater amount of education must occur within this domain to ensure adequate preparation for service at higher levels of responsibility. The Army has devoted time and energy creating training and education doctrine; however, none of the doctrinal or related training or administrative publications address how to design training in the operating force. Commanders have access to several tools to use as they create training events, but they focus primarily on the resourcing of training with little guidance or direction on the content. In 2016, the US Army Combined Arms Center documented this problem in the *Enhancing Realistic Training White Paper*. The white paper is a useful document for describing what future training should consist of, especially as it relates to the inclusion of all the complexities expected on a future battlefield, but it lacks a description of how to design the training. Taken at face value, commanders could assume that when creating a training event, they must include all possible complexities in the scenario to prepare participants to operate effectively in a complex world. Additionally, the white paper references other joint and Army publications (such as doctrine, guidance, regulations, and white papers) but does not include any academic work or research in training, much less education. For the Army to continue developing soldiers and leaders in the operational domain while also preparing organizations to operate in a complex world, it must use evidence-based practices of the learning sciences to design training. The argument contained here presents an operational design for the development and integration of efforts to enhance realistic training.[5]

---

[4] US Department of the Army, Army Doctrinal Reference Publication (ADRP) 7-0, *Training Units and Developing Leaders* (Washington, DC: Government Printing Office, 2012), 1-2–1-4.

[5] US Army, ADRP 7-0 (2012), 2-1 – 3-12; US Department of the Army, *Enhancing Realistic Training White Paper* (Fort Leavenworth, KS: Army University Press, 2016), 2-12.

The science of learning is based on an understanding of how individuals and groups learn. This field is now over one hundred years old, and it has gone through several major shifts in that time. This paper uses the term *learning* as defined by Richard E. Mayer, a psychologist from the University of California, Santa Barbara:

> Learning is the relatively permanent change in a person's knowledge or behavior due to experience. This definition has three components: (1) the duration of the change is long-term rather than short-term; (2) the locus of the change is the content and structure of knowledge in memory or the behavior of the learner; (3) the cause of the change is the learner's experience in the environment rather than fatigue, motivation, drugs, physical condition, or psychological intervention.

This definition allows for its application to both individual and organizational outcomes. Whenever an organization trains, one expects that trainees will come out of the event changed (hopefully for the better), that the change will be long-lasting, that trainees will behave differently given a certain set of circumstances, that the change will be repeatable, and that it will occur regardless of varying conditions. The differences between military and academic views of training and education are apparent. The Army distinguishes the primary difference between training and education as the focus on the known versus the unknown. The Army definition of training is "a structured process designed to increase the capability of individuals or units to perform specified tasks or skills in known situations," while education focuses on "an individual's ability to perform in unknown situations." In the learning sciences, training is a subset of education, with learning occurring in both. In academia, "training" refers to those instructional experiences that are focused on individuals acquiring specific skills that they will apply almost immediately, although scholars acknowledge that similar actions occur in both training and education. To improve training, the Army must embrace the idea of training as learning, as opposed to training as experience.[6]

---

[6] Richard E. Mayer, *Applying the Science of Learning* (Boston, MA: Pearson/Allyn & Bacon, 2011), 18; Richard E. Mayer, "Learning" in *Encyclopedia of Educational Research* (New York: The Free Press, 1982), excerpt from 1040; US Army, Army Regulation 350-1, *Army Training and Leader Development* (Washington, DC: Government Printing Office, 2014), first quote on 239, second quote on 229.

Methodology

To best develop operationally effective formations as described in *AOC 2020-2040*, unit training methodologies must use a mixed approach of behaviorist, cognitivist, and conceptualist theories in collective training designs. This monograph identifies those organizational and adult learning theories that best align with the requirements of *AOC 2020-2040* based upon both historical analysis and multidisciplinary research. These theories should be useful for informing training methodologies that transfer knowledge needed to prepare units to win in a complex world.

This monograph examines the applicability of adult learning theory in collective unit training. It presents and analyzes the concepts of adult learning as well as Army doctrine and concepts related to training and learning. It further identifies evidence-based practices for effective transfer of knowledge to achieve desired outcomes by adopting specific knowledge types. This information forms the initial section of the paper, which informs the discussion and recommendations of the following sections.

Two case studies provide background and evidence for analysis of linkages between learning theories, training methodologies, and operational concepts. To understand the underlying theory of learning within the case studies, the following analysis evaluates each historical training methodology against the three common learning metaphors: response strengthening, information acquisition, and knowledge construction.[7] In the first case study, the mobilization for World War II, the training methodologies employed by the Army Ground Forces (AGF) relied upon behaviorist learning theories. These methodologies achieved specific outcomes related to the Field Service Regulation (FSR) of the time. Next, analysis of the Training Revolution of the 1970s and 1980s reveals how cognitivist learning theories contributed to the success of Air Land Battle doctrine through training methodologies employed at the Combat Training Centers

[7] Mayer, *Applying the Science of Learning*, 22-29.

(CTCs), the Battle Command Training Program (BCTP)—now known as the Mission Command Training Program or (MCTP)—and elsewhere.

Analysis of these case studies illustrates how learning theories can inform unit training to achieve specific learning outcomes. The final section synthesizes the findings from the two case studies and the training outcomes required by current doctrine and describes how additional learning theories can complement and improve traditional training methodologies. These findings offer insight for planners and leaders to develop unit training methodologies to achieve maximum knowledge transfer.

The Science of Learning

One can best describe learning as a change in knowledge attributable to experience. Learning always involves long-lasting, internal change within the learner. If no change takes place, learning has not occurred. This change occurs in the realm of knowledge, which broadly includes declarative knowledge, intellectual skills, cognitive strategies, attitudes, and psychomotor skills. No method exists to detect changes in knowledge directly; instead, they manifest in the learner's behavior. Change in knowledge occurs because of the learner's experience. This natural ability of the human species has contributed to its ability to survive and thrive. Education and training create deliberate experiences that directly influence the change of knowledge within the learner. For example, purposeful arrangement of the learner's environment can achieve specific changes in the learner's knowledge.[8]

One can therefore understand learning as the transfer of knowledge. Transfer is the ability of a learner to effectively apply new knowledge, such as a new skill or behavior, in a new context or event. If the learner performs a skill better or an entirely new skill in an acceptable manner, positive transfer occurred. Negative transfer has taken place when learners perform the skill less

[8] Mayer, *Applying the Science of Learning*, 14; Sharan B. Merriam and Laura L. Bierema, *Adult Learning: Linking Theory and Practice* (San Francisco, CA: Jossey-Bass, a Wiley Brand, 2014), 24-26.

effectively than before the learning occurred. Often, negative transfer occurs because of unintended learning. Neutral transfer occurs when one notes no change in observable behavior. Successful transfer requires deliberate promotion of knowledge that has usefulness in multiple contexts. In this way, learning remains context-specific, but one can transfer knowledge for multiple contexts.[9]

Learning Metaphors

Researchers have developed three metaphors of learning to characterize how learning works. They are distinguished by the way knowledge is conceived, the role of the learner, and the role of the teacher, or source of knowledge. Each metaphor is based on research, each has influenced learning theory, and education practice since these terms first appeared in the literature. They are not mutually exclusive, as more than one learning metaphor can potentially be seen in a singular learning experience. Additionally, research has shown that different metaphors fit different situations. Each metaphor has an appropriate role based upon the learner, the intended knowledge, and the desired outcome. For the analysis below, they provide a common lens through which to examine the nature of learning as it occurs in training.[10]

Response strengthening is most associated with the teaching of skills using drill and practice. Response strengthening assumes learning occurs through a process of association. In this metaphor, the learner is a passive recipient of rewards and punishments while the instructor (or environment) dispenses the rewards and punishments to strengthen or weaken the learner's association of knowledge. This results in the learner having a more positive association with the

[9] Mayer, *Applying the Science of Learning*, 20-21; Patricia L. Smith and Tillman J. Ragan, *Instructional Design* (Wiley-Jossey-Bass Education. Hoboken, NJ: J. Wiley & Sons, 2005), 18-19.

[10] Mayer, *Applying the Science of Learning*, 22-23; Smith and Ragan, *Instructional Design*, 18-19; Merriam and Bierema, *Adult Learning: Linking Theory and Practice*, 24-25.

correct knowledge than the incorrect knowledge. Researchers first described this metaphor in the early 1900s.[11]

Information acquisition is most associated with learning through memorization. In this metaphor, learning is nothing more than the addition of information to memory. The learner in this metaphor is the passive recipient of whatever information the instructor or environment delivers. Researchers sometimes refer to this metaphor as the "empty vessel model" because it assumes the learner's memory is an empty container waiting to be filled. This metaphor is most relevant to the learning of facts and became popular in the mid-1900s.[12]

Knowledge construction is the most dominant metaphor today in higher education. This concept assumes learning occurs as the learner builds cognitive models of the knowledge. The learner in this case is actively trying to make sense of the new experience and creating knowledge from it. This metaphor is most applicable to the learning of intellectual skills, and first appeared in the late 1900s.[13]

Learning Theories

Learning theories attempt to describe, explain, and predict learning. Instructional designers use them to promote specific cognitive processes to achieve a desired learning outcome. These theories are not mutually exclusive; more than one can be present in a single learning experience to achieve different outcomes. Some debate exists in academia regarding what qualifies as a true learning theory, but consensus among experts holds that several evidence-based concepts, whether theories or philosophies or something else, can help one understand the

[11] Mayer, *Applying the Science of Learning*, 22-23; Smith and Ragan, *Instructional Design*, 25-26.

[12] Mayer, *Applying the Science of Learning*, 22-23; Smith and Ragan, *Instructional Design*, 26-29.

[13] Mayer, *Applying the Science of Learning*, 22-23; Smith and Ragan, *Instructional Design*, 19-20.

learning process. This paper employs five theories that are widely accepted in academia, each of which has applicability to military training.[14]

Behaviorism is built on the idea that learning is nothing more than a change in behavior. To achieve learning, this theory suggests, one should reward positive changes in the learner while ignoring or punishing negative changes. Behaviorist theory focuses on only those aspects of learning that one can observe, and therefore generally does not concern itself with the mental processes that occur during learning. This theory emphasizes the influence of the environment on learning, as opposed to the learner. Behaviorism shares much in common with the ideas of classical and operant conditioning, as illustrated by Pavlov's famous dogs. Behaviorism was popular in the early 20th century for all forms of education, and continues to influence instructional designs and methodologies today, particularly in training. This theory is applicable to military training particularly regarding the development of psychomotor skills.[15]

The learning theory of humanism, in contrast to behaviorism, describes learning as the development of the person. This theory presupposes that learning is controlled by the subconscious mind, and the environment has little, if anything, to do with it. Instructional design related to this theory relies heavily on self-directed learning. Motivation is the critical factor in this theory. Without motivation, the learner either will not learn, or will not learn the appropriate material. This learning theory primarily applies to the Army's efforts to build life-long learners through self-directed study.[16]

Cognitivism is the most dominant current learning theory. This theory identifies learning as a mental process. Cognitivism places the locus of learning in the learner's mental processes, as opposed to the environment (behaviorism) or the whole person (humanists). Researchers in this

---

[14] Merriam and Bierema, *Adult Learning: Linking Theory and Practice*, 24-26; Smith and Ragan, *Instructional Design*, 22-25.

[15] Merriam and Bierema, *Adult Learning: Linking Theory and Practice*, 26-28; Smith and Ragan, *Instructional Design*, 25-26.

[16] Merriam and Bierema, *Adult Learning: Linking Theory and Practice*, 29-31.

field think of the human mind as a computer and treat learning as the creation and movement of memory much like the function of a central processing unit. The concepts of this theory apply especially to adults, as the memories they have already created (what they have already learned) have been found to affect how they learn new information. Regarding the Army, this theory of learning as a process ties directly to many of the processes we now use for planning and operating.[17]

Constructivism is built upon the concept that learning results from a person's effort to make sense of an experience. People learn by constructing meaning from experience; thus, learners must actively participate in learning events, not just absorbing information, but analyzing it and processing it in their own way. This theory poses more challenges to instructional designers, because they cannot treat the learner as an empty vessel waiting to be filled, but instead must recognize and account for the learner's role as an active participant in a complex system of learning. In the constructivist's view, learning happens as a form of negotiation between the learner and the experience/environment/instructor. Learning occurs based upon a personal interpretation of knowledge based on experience, which means prior experience additionally influences what an individual learns in any new experience. This transaction between the learner and the learning event or environment creates both opportunities and limitations in military training.[18]

Application in the Army

Educational and learning theory has had a significant impact on American military training and education since 1775. Specialist researchers have focused their efforts on the specific needs of military learners, but many common concepts exist among academic and military

[17] Merriam and Bierema, *Adult Learning: Linking Theory and Practice*, 31-35; Smith and Ragan, *Instructional Design*, 26-29.

[18] Merriam and Bierema, *Adult Learning: Linking Theory and Practice*, 36-37; Smith and Ragan, *Instructional Design*, 19-20.

applications. The learning sciences have had their greatest impact on PME. Beginning in the late 20th century, the military undertook several efforts to update all PME courses with the latest educational best practices from academia. The most recent of these began in 2011, when the Department of the Army published the *Army Learning Concept for 2015*. This concept created a new standard for instruction across all PME by incorporating all aspects of the learning sciences to improve learning for all ranks. The newly founded Army University has continued to develop and evolve the Army's understanding of the learning sciences to improve instruction at all PME courses. The new *Army Learning Strategy* is an initial effort to apply the learning sciences across the force, to include unit collective training.[19]

Training for a World War

By 1939, war was a very real possibility for the US Army. European and Asian powers were already at war, but the American public did not yet fully understand the potential scope of the war. New technology and foreign concepts developed during the interwar period radically changed the nature of war between industrialized nations. In the United States, this led to a view of future major power war as a "war of machines," fought with high-tech airplanes, naval vessels, and ground systems like air defense artillery. This led to the idea that only the best soldiers (in terms of intelligence and fitness) should serve in high-tech positions, while soldiers that ranked below average in both categories could handle more traditional duties like infantry, armor, and artillery. This had a profound effect on the AGF when Protective Mobilization began in 1940, and the government authorized increases in military personnel and equipment for defensive purposes only.[20]

---

[19] Jeffrey Zacharakis and Cheryl Jean Polson, eds. *Beyond Training: The Rise of Adult Education in the Military*, Jossey-Bass Higher and Adult Education Series, (San Francisco: Jossey-Bass, 2012), 5-28; Grant T. Hammond, "Transforming Military Education for the 21st Century," in *Innovative Learning: A Key to National Security*, edited by Ralph Doughty, Linton Wells, and Theodore C. Hailes (Fort Leavenworth, KS: The Army Press, 2015), 35-69.

[20] Mark T. Calhoun, *General Lesley J. McNair: Unsung Architect of the U.S. Army* (Lawrence: University Press of Kansas, 2015), 173-216; David M. Kennedy, *The Oxford History of the United States,*

Meanwhile, senior military and civilian leaders began planning for a massive growth of the military given the increasing likelihood of direct American involvement in the war. The US Army had not been idle in the years following World War I, but its ability to conduct realistic training suffered because the public did not want America involved in another large-scale European war. Army leaders knew that if America became involved in the war, it would require significant changes to its structure, equipment, and concepts. Additionally, leaders knew that the scale of a future war would require a massive influx of new personnel and the creation of new formations that would require significant training to make them combat-ready.[21]

The US Army in 1939 was obsolete in comparison to the armies of the world's most powerful nations. Its understrength formations relied on aging, WWI-era equipment, and trained using out-of-date operational concepts. In July 1939, the Army published a new FSR that attempted to bring forward concepts that could compete with European armies. This regulation incorporated new organizations and formations with new equipment that could dramatically change the tempo and reach of Army operations and focused on the centrality of combined arms operations as the key to success in combat. The 1939 FSR marked a significant change from the Army's 1923 FSR, but the two manuals had more similarities than differences. The separate branches of the Army each had their own priorities and were hesitant to nest their doctrine to the new concepts of the 1939 FSR. This began, though, a two-year process of revising the FSR into a new manual that would unite all the arms into a single operational concept. When published in 1941, Field Manual (FM) 100-5, *Operations*, contained new concepts in mechanized warfare, and guided the Army through June 1944, when the War Department published the final version of

---

vol. 9, Freedom from Fear: the American People in Depression and War, 1929-1945 (New York: Oxford University Press, 1999), 615-637, quote on 616.

[21] Edwin P. Hoyt, *The GI's War: American Soldiers in Europe During World War II* (New York: Cooper Square Press, 2000), 1-15; Peter R. Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, Modern War Studies (Lawrence: University Press of Kansas, 1999), 16-83.

FM 100-5 to appear during the war. The 1941 manual included the most advanced operational concepts of any major nation in the war and unified all the latest technology and tactics into a modern combined arms concept.[22]

While the interwar Army was a highly professional force, it was also incredibly small relative to its peak of more than eight million personnel in the final months of World War II. The War Department began a massive recruiting and conscription campaign in 1940 to bring the Army up to the required size. This brought in a huge cross-section of society. The government created mental and physical exams to classify recruits, intending to enable boards to place new soldiers in positions where their pre-existing qualities best fit the high-tech demands of mobilization for mechanized warfare. Often, this meant the best and brightest went to the most technical roles across the services, while the remainder went to the AGF. With these new personnel, the Army created plans to build new formations and train them for employment in combat overseas. These new units would be hastily constructed with some experienced members from the interwar Army and many new soldiers fresh from their homes. As mobilization progressed, the manpower crisis of 1942 emerged, unexpectedly causing projected recruits into the Army to fall well short of requirements. This shortage hit the AGF the hardest, as FDR decided to increase the size of the Army Air Force and US Navy while reducing the end state target number of divisions from 200 to 90. This increased the amount of training required while simultaneously reducing the pool of available trainers. Training these new formations to operate in accordance with advanced operational concepts and with the latest technology would be a major undertaking.[23]

---

[22] Calhoun, *General Lesley J. McNair: Unsung Architect of the U.S. Army*, 222-229; Peter J. Schifferle, *America's School for War: Fort Leavenworth, Officer Education, and Victory in World War II* (Lawrence: University Press of Kansas, 2010), 36-61.

[23] Calhoun, *General Lesley J. McNair: Unsung Architect of the U.S. Army*, 291-308; Hoyt, *The GI's War: American Soldiers in Europe During World War II*, 16-25; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 16-48; Schifferle, *America's School for War: Fort Leavenworth, Officer Education, and Victory in World War II*, 168-173.

Training Doctrine

The US Army codified its doctrinal training methodology in Field Manual (FM) 21-5, *Military Training*, in July 1941. This document included basic instructions for training all elements of the Army, as well as examples of more detailed methods to illustrate the application of basic concepts in more specific contexts. It recognized the purpose of training as the assurance of victory in war and directed that training must create an offensive spirit throughout the Army. Additionally, it identified specific qualities that Army training should develop: morale; discipline; health, strength, and endurance; technical proficiency; initiative; adaptability; leadership; teamwork; and tactical proficiency. To accomplish this, units trained by division in an applicatory and decentralized manner, beginning with individual training, then moving on to small unit and then division collective training, usually culminating with participation in multi-division competitive exercises. In doing so, training progressed from basic to advanced topics and then to practice via large-scale maneuvers in realistic environments.[24]

To guide this process, FM 21-5 included four fundamentals of military training. First, it defined military training as nothing more than the application of common sense to military ends. All the concepts and doctrine used in training were simple enough that any average man could understand them if presented properly. Second, it specified that all trainees should have an open mind and a preference for active learning. Thus, FM 21-5 assumed all trainees possessed motivation and eagerness to learn. This was a questionable assumption, based on the belief that anyone preparing to go to war would be motivated by the desire to stay alive in combat. While this did not turn out as envisioned, the final two fundamentals focused on related issues. The third fundamental held that the average man learns better when the training has a practical value for him. This concept—that everyone learns better when they understand how that learning can

[24] US Army, Field Manual (FM) 21-5, *Military Training* (Washington, DC: Government Printing Office, 1941), 1-3.

benefit them later—remains a foundational idea of adult learning today. To accomplish this, FM 21-5 directed trainers to focus on the practical value of the training in combat, which made the trainer responsible for building soldiers' motivation to learn. The final fundamental—that positive reinforcement improves learning—required trainers to give praise and constructive criticism when appropriate. The most recent academic research in learning supports this fundamental as well. The remainder of FM 21-5 operationalized the four fundamentals of training.[25]

The defining characteristic of any training event was instruction of a new concept or skill. Success at applying any learned concept or skill depended first on the instruction of the topic. Twenty-three of the seventy-seven pages of FM 21-5 provide guidance and techniques for instruction. The manual describes instruction as a six-step process: preparation, explanation, demonstration, application, examination, and discussion. Preparation was a responsibility of both trainers and trainees. Doctrine required leaders to certify trainers as masters of their training material and specified that trainees must arrive at training with all necessary material and equipment as defined by the trainer. Trainers could conduct the explanation and demonstration components of instruction through a variety of methods, including lectures, conferences, pure demonstrations, group performance, or coach-and-pupil method. FM 21-5 provides a thorough description of each of these methods with considerations for when to use each based on the conditions and topic of the training. The application of the instruction in training then occurred through another progressive cycle.[26]

Per FM 21-5, units applied instruction in collective training through drill, practice, and applicatory tactical exercises. Drill consisted of formal practice in standardized procedure. At these highly controlled events, units performed tasks repetitively and with rigid precision. It is important to note, however, that FM 21-5 emphasizes the purpose of drill as a means to an end,

[25] US Army, FM 21-5 (1941), 14-15.

[26] Ibid., 21-44.

not an end in itself. Successful drilling created a foundation of knowledge in the formation to allow it to progress through training. Practice—a less formal repetition of tasks than drilling—took place continuously throughout the training period. Applicatory tactical exercises, the most important part of unit training, allowed units to apply tactical doctrine to imaginary or simulated combat conditions.[27]

These applicatory tactical exercises formed the capstone of FM 21-5's training methodology. These exercises allowed units to apply doctrine in a way that built a richer and fuller appreciation of the concepts included in various field manuals. Applicatory tactical exercises not only created an opportunity to practice the application of doctrine, but also to test the unit and the doctrine. There were two general classes of exercise: decision and execution. Decision exercises focused on leadership and how a chain of command communicates and makes decisions as an organization. Execution exercises provided opportunities for the entire organization to exercise both individual and collective skills to accomplish a collective task. Each of these types of exercises took place in the form of map exercises, map problems, map maneuvers, tactical rides/walks, terrain exercises, staff rides/walks, historical rides, field exercises, or field maneuvers.[28]

In addition to these collective training events, units continued the training and development of individuals through troop schools, physical training, and athletics. Troop schools served as a substitute for centralized professional military education. Through these schools, units could ensure uniformity of preparations for officers, noncommissioned officers, technical specialists, and instructors in their specific branches or areas of specialty. Physical training and athletics emphasized the development of all the individuals of the unit. Though this often took

[27] US Army, FM 21-5 (1941), 11-12.

[28] Ibid., 44-57.

place in group activities, FM 21-5 warns against overemphasizing the importance of the team as that could result in the neglect of the necessary development of individuals.[29]

To guide units in the planning and execution of training, FM 21-5 contains additional guidance for training management. The limiting factor most unit leadership faced in planning training was time. The Army wrote FM 21-5 for a mobilizing army, and the ability to generate combat power from raw recruits to combat-ready formations was recognized as an issue of time. To address this, the Army published separate mobilization programs for different types of formations, with FM 21-5 providing guidance and recommendations for how to manage the requirements of the mobilization program given the reality of limited time available. Specifically, it provides best practices for the lengths of certain activities. For instance, drills should not exceed one hour at a time, as longer periods would result in lost motivation and attention. Mounted drill or driving, however, should be no less than one hour, not including preparatory equine or motor stable activities. To achieve best results from physical training, FM 21-5 recommends exercise periods of 15 to 30 minutes. To further support training management, the manual provided recommendations for allocation of time by topic for certain formations. For infantry units, it recommends 20% of available time go to basic subjects, 32% of time to technical subjects, and 48% of time to tactical subjects. For more technical formations, such as field artillery, it recommends 16.9% to basic subjects, 64.6% to technical subjects, and only 18.4% to tactical subjects. All these considerations, though, were not restrictive, but instead were best practices units could use and apply as the situation permitted. In this, FM 21-5 provided inexperienced units with a wealth of resources for both the design and management of a training program to prepare for war.[30]

[29] US Army, FM 21-5 (1941), 13-14.

[30] Ibid., 3-11, 57-62.

Training in Practice

To generate forces for World War II, the US Army created a deliberate, methodical process to build and train units from individual military instruction through collective, combined arms training. Prior to mobilization for the war, the Army consisted of ten Regular Army divisions and eighteen National Guard divisions. Initial mobilization efforts trained and reorganized these twenty-eight divisions and grew eight more by the end of 1941 for a total of thirty-two infantry divisions, two armored divisions, and two cavalry divisions. In 1942, the Army mobilized thirty-eight more divisions; twenty-seven infantry, nine armored, and two airborne. The Army mobilized seventeen more divisions in 1943, bringing the final total of US Army divisions activated during the war to ninety-one: sixty-seven infantry, sixteen armored, three cavalry (the 2nd Cavalry Division counting for two of these, as it activated, de-activated, and then re-activated), and five airborne. In addition to this growth, many non-divisional units, such as tank destroyer battalions, separate field artillery battalions, mechanized cavalry squadrons, and transportation units, were organized and trained to create effective combined-arms teams to support the divisions as corps- and army-level troop pools. To manage this growth, the Army conducted a major re-organization of its administrative structure from 1940 through 1942. From the General Headquarters (GHQ), which had been the higher operational headquarters for all Army forces in the continental United States, the Army created a series of functional commands: the AGF, the Army Air Forces, and the Army Service Forces. The AGF was to supervise and certify all ground units, including all maneuver divisions, as they progressed through construction and training to deployment overseas.[31]

[31] Bell I. Wiley, Army Ground Forces Study No. 12: *The Building and Training of Infantry Divisions* (Washington, DC: Army Ground Forces Historical Section, 1946), 1-5; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 16-23, 35; Calhoun, *General Lesley J. McNair: Unsung Architect of the U.S. Army*, 250-254.

The War Department codified GHQ's initial plan for the creation and training of divisions in January 1942. The AGF improved and adapted the plan over time to meet operational needs and requirements, but the general concept remained the same. The process lasted approximately sixty-two weeks from start to deployment including all manning, equipping, and training to make the division combat-ready.[32]

The initial training plan for mobilizing an infantry division was a forty-four-week program. The division's internal training was composed of three elements: basic and individual training, unit training, and combined arms training. To support the division leadership, AGF provided detailed charts that broke each training period into weeks, days, and hours for training scheduling. Little room was available for a unit's leadership to adjust the schedule. Individual training lasted seventeen weeks. The first month was generic for all new soldiers within the division. This included all the new inductees' basic military training, to include customs and courtesies, physical hardening, and other initial entry training. The second month of training focused on technical subjects, and training became more diverse. Individuals received training on their specific jobs and roles within the formations. The final month transitioned from technical to tactical subjects. This gave soldiers an opportunity to transition their new skills to practical application as a part of a unit. During this time, the soldiers began working as a part of crews and squads to learn while they were doing. The culmination of this period was a series of inspections conducted by the division's higher army or corps commander and staff to ensure the training had adequately prepared the soldiers to progress to more advanced training. Instead of testing every soldier, the higher headquarters selected a random sampling of grades and roles to perform specified tasks.[33]

---

[32] Wiley, *The Building and Training of Infantry Divisions*, 1-2; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 16-19.

[33] Wiley, *The Building and Training of Infantry Divisions*, 2-8.

Unit training was branch-specific and lasted another thirteen weeks. The purpose of this phase was to take the individual skills learned in the previous phase and apply them across the formation as a collective team. This provided units an opportunity to learn and practice their functional role within the division. This included live-fire training at various echelons. The progression through echelons was not deliberate in this phase, but instead advanced as appropriate based upon the abilities of the formation. For an infantry unit in this phase, the emphasis was on the unit's ability to attack a fortified area. Additionally, units incorporated a minimum of sixteen hours a week to night operations training. During this period, AGF staff evaluated maneuver platoons and companies, and artillery batteries and battalions before the division could move forward to combined arms training.[34]

Combined arms training was the final period and lasted fourteen weeks. During this period, units from the different arms would train together as combined arms teams in tactical exercises. This period included several combined arms live fire exercises, incorporating multiple subordinate formations of the division into a single training event. In addition, regimental combat teams conducted maneuvers against each other in an unscripted tactical exercise. AGF staff would evaluate the division based upon maneuver battalion exercise tests and regimental combat team performance in maneuvers.[35]

A continuous feature of this training plan was constant schooling for both the commissioned and noncommissioned officers conducted concurrently to other training. This schooling was to ensure standardization of instruction across the division and create a level of expertise within the leadership of the division. Following the combined arms period of training, the division was expected to participate in higher-echelon maneuvers, but this was not a necessary component of making a combat-ready division. This methodology, with some

[34] Wiley, *The Building and Training of Infantry Divisions*, 7-9.

[35] Ibid., 8-11.

modifications, was used over the course of the next two years to mobilize the US Army for World War II.[36]

Initial changes to the training program for new divisions were based primarily on overseas requirements. First, the training program for divisions fell from forty-four to thirty-five weeks long. This resulted in the individual training period shortened by four weeks and both unit training and combined arms training periods shortened by three weeks each. This shortening was in anticipation of increased overseas requirements in 1943 and 1944. General McNair, the AGF commander, believed that shortening the period was preferable to having to pull units out of training early for unanticipated requirements. The second change to the training program was in increase in testing. Initial combat experiences in North Africa and the South Pacific identified deficiencies at all echelons from individual soldier through division. The AGF increased testing of units to ensure theater commanders were receiving qualified formations. Both were top-down driven changes from senior theater commanders.[37]

From 1943 through 1944, the AGF modified the standard training plan for divisions several times. Three themes marked positive changes in the training methodology. First, the AGF made deliberate efforts to incorporate lessons learned from combat experience overseas. Members of the AGF staff were regularly sent overseas to interview leaders and observe combat to identify opportunities for improvement in training. General McNair traveled overseas twice for personal observation of units in combat, which led to his untimely death as the highest-ranking American officer killed on the Western Front in World War II. These observations were consolidated and incorporated into training plans and guidance immediately. Additionally, the

[36] Wiley, *The Building and Training of Infantry Divisions*, 7-11.

[37] Wiley, *The Building and Training of Infantry Divisions*, 11-15; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 59-65; Calhoun, *General Lesley J. McNair: Unsung Architect of the U.S. Army*, 274-291.

AGF created follow-on training to the standard training plan for divisions that incorporated the latest lessons learned which contributed directly to the next theme of change.[38]

The second area of improvement in unit training was the incorporation of greater realism into training. The AGF updated the training program to increase realism across all three phases of training. Individual training incorporated more firing under combat conditions. Unit training was improved with more unscripted exercises in force-on-force scenarios to increase realism and incorporate competition. Corps incorporated supporting arms, such as tank destroyers and separate tank battalions, in division training earlier so units could experience working with each other more often. The AGF also issued guidance to improve collective training realism by reducing safety limitations on live fire exercises. Umpires and safeties served a limited role, and by the end of training were to not take part in live fire training. Additionally, division and corps exercises were moved to more austere locations, such as the California-Arizona Maneuver Area, to exercise all aspects of the formation in a new environment that more accurately represented a theater of operations.[39]

Finally, training improved through increased AGF supervision. Inspections became significantly more thorough, but not more frequent, and the AGF inspection teams doubled in size. This allowed AGF leadership to gain a much better understanding of the state of the units' training as well as more opportunities for coaching and mentorship. Further, feedback was no longer provided in a written report, but was instead presented in-person after the inspection to provide immediate and accurate feedback. Additionally, AGF leadership revised the inspection

[38] Wiley, *The Building and Training of Infantry Divisions*, 11-15; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 68-83.

[39] Wiley, *The Building and Training of Infantry Divisions*, 25-26; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 68-83.

requirements and unit tests and evaluations to ensure they adequately evaluated units based on the needs of theater commanders. [40]

The Army's methodology for mobilizing divisions for combat in World War II was built based on necessity. While many of the concepts were continuations of pre-war training doctrine, operational requirements influenced decision-making and outcomes during the war. The success of this system, though, is evident in the campaigns of the US Army in northwest Europe, as divisions trained on the lessons of combat in North Africa and the South Pacific entered combat for the first time and were successful.

Analysis

The Army's training doctrine at the beginning of World War II was comprehensive and user-friendly. The fiscal constraints of the inter-war period heavily influenced doctrine by forcing the Army to be innovative in creating opportunities for learning. This resulted in doctrine that included a large menu of options for how to train. For each unit collective task, the Army identified conditions for implementation and procedures for execution. To train these tasks, the Army treated them as a combination of declarative knowledge conducted with psychomotor skills. The doctrinal approaches to collective training emphasized information acquisition through classes and lectures, with simultaneous response strengthening through practice and exercises. The benefit of this combination of techniques is the emphasis on practical application of knowledge. There is little consideration, though, of knowledge construction included in the doctrine. The approaches in this training doctrine therefore appear to match most closely with the behaviorist and humanist theories of learning.

The conduct of training, of course, did not always match the corresponding doctrine. The Army created training doctrine to be comprehensive to a unit's needs and support continuing

[40] Wiley, *The Building and Training of Infantry Divisions*, 27-28; Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*, 78-83.

development of the unit, but mobilization for World War II did not allow for the full implementation of the doctrine. Time constraints and other requirements forced leaders to prioritize limited time and resources in preparing their units for overseas deployments. To rapidly turn a group of civilians into an organized fighting formation, the AGF-created mobilization calendar focused primarily on response strengthening. This ingrained in new divisions and separate battalions the psychomotor skills of war from their inception. Training shaped the behavior of units so they could be employed rapidly as interchangeable parts of larger formations.

This combination of doctrine and execution allowed the Army to field fighting forces overseas reasonably quickly but without sacrificing critical training tasks. Behaviorist training that focused on psychomotor skills created units well suited for pooling and mixing to create multi-functional formations. The humanist aspects of the training doctrine also continued to contribute. The emphasis on information acquisition created an expectation for continued learning. This resulted in formations that could learn while operating, which improved US Army performance throughout World War II.

The Training Revolution

The year 1973 marked a turning point in training for the US Army, during which several events created conditions that led to what is now referred to as the Training Revolution of the 1970s and 1980s. Operationally, the Army officially ended its direct involvement in the Vietnam conflict with the deactivation of Military Assistance Command – Vietnam (MACV) on March 29, 1973. Externally, the lethality and decisiveness of the Arab-Israeli War in October 1973 shocked the Army. Internally, the Army began a dramatic transition to an all-volunteer force with the abolishment of the draft on July 1, 1973. Organizationally, the Army generated lasting change in its approach to training and education with the establishment of the US Army Training and

Doctrine Command (TRADOC) on July 1, 1973. Each of these changes had a profound impact on the methodologies units would use to prepare for future wars.[41]

The US Army recognized in 1973 that years of combat in Vietnam had left it unprepared to fight the Soviet Army in Europe. With the deactivation of MACV, the Army began to reexamine its operational concepts and force structures. Also in 1973, the Arab-Israeli War shocked many American senior leaders and planners. American-trained and equipped Israelis fought Soviet-trained and equipped Arabs, which created a laboratory for understanding strengths and weaknesses of the technology and doctrine of the Cold War foes. Each side displayed incredible lethality and speed that far exceeded the post-Vietnam Army's capabilities. Previously, the US Army had believed it maintained a significant technological edge over Soviet-equipped forces, but this war disproved those beliefs. The Army found several areas for improvement in its organization and equipment. Additionally, the speed of the war showed a need for combat-capable forces at the start of a war. American forces could no longer rely on an extended period of mobilization to generate combat power but would have to "fight tonight" in the event of a ground war with Soviet forces.[42]

The transition to an all-volunteer force had its own impact on the future of unit training. Volunteers expected a level of autonomy and independence not desirable in a conscripted force, but they also possessed higher motivation and willingness to perform than draftees. New incentives also brought some higher-quality personnel into the service, and additional incentives

[41] Anne W. Chapman, *The Army's Training Revolution, 1973-1990* (Washington, DC: US Army Center of Military History, 1994), 3-10; John L. Romjue, Susan Canedy, and Anne W. Chapman, *Prepare the Army for War: A Historical Overview of the Army Training and Doctrine Command, 1973-1993* (Fort Monroe, VA: Office of the Command Historian, Training and Doctrine Command, 1993), 1-7.

[42] John L. Romjue, *American Army Doctrine for the Post-Cold War* (Washington, DC: Center of Military History, 1997), 6-20; Romjue, Canedy, and Chapman, *Prepare the Army for War: A Historical Overview of the Army Training and Doctrine Command, 1973-1993*, 51-58. The phrase "fight tonight" appears in multiple US Army doctrinal manuals and other publications of the time.

kept good soldiers and leaders in uniform for longer. The transition to an all-volunteer force took time, but it would require changes to training methodologies throughout the Army.[43]

Training Doctrine

The Training Revolution brought standards-based, performance-oriented training to the Army. Each task the Army expected a unit to perform in combat had an associated standard for its execution. The Army published these standards and used them to evaluate unit performance. In doing so, it ensured that unit leaders and soldiers knew what was expected of them, and based on their evaluation results, the Army knew how well that unit had performed in its most recent training. This allowed the Army to gauge readiness in an objective manner across the force.[44]

The training methodologies used during the Training Revolution evolved little throughout the 1970s and 1980s, but the changes that did occur were captured and reinforced in the 1990 Field Manual (FM) 25-101, *Battle Focused Training*. This document provided guidance and recommendations to leaders in the development and execution of training programs. The Army intended it to be a practical guide for leaders in the planning and conduct of training. The title, Battle Focused Training, describes the theme of the entire manual. The Army recognized that units faced a massive increase in training requirements and other time commitments and wanted to use this doctrine to focus their efforts on training those skills used in combat. Specifically, the Army saw training as the cornerstone of readiness and the basis for credible deterrence. Units needed to be prepared to fight and win the first battle of the next war, and Battle Focused Training was the Army's way to prepare them for that fight.[45]

---

[43] Beth Bailey, *America's Army: Making the All-Volunteer Force* (Cambridge, MA: Harvard University Press, 2009), 34-65; Romjue, Canedy, and Chapman, *Prepare the Army for War: A Historical Overview of the Army Training and Doctrine Command, 1973-1993*, 59-64.

[44] US Department of the Army, Field Manual (FM) 25-101, *Battle Focused Training* (Washington, DC: Government Printing Office, 1990), iii.

[45] Ibid.

Because of the manual's focus on battle, it dealt primarily with the preparation for combat. Commanders derived training requirements from the skills required to complete wartime missions specific to their units. This differed significantly from the training methodologies of the 1940 FM 21-5. Prior to the Training Revolution, higher headquarters told units what to train on. In contrast, *Battle Focused Training* allowed commanders to determine their own training objectives based upon what their higher headquarters expected them to do in combat. Each subordinate element then trained specific collective tasks that supported their higher headquarters' collective tasks. This allowed commanders to prioritize their training time and resources, but it also meant that no unit could train for every possible task. The battle focus allowed commanders to justify their choices and prioritize those tasks that they deemed most important, and that most directly supported their higher headquarters' collective tasks.[46]

To achieve this battle focus, FM 25-101 dedicated 62 of the 141 pages of the base document to training management. The doctrine described a four-step cycle for training management: task development, planning, execution, and assessment. Unit leaders used task development to select the collective and individual tasks that they needed to train for based upon the unit's wartime mission and current training status. Planning involved the resourcing of training events, while execution dealt with the conduct of the training itself. Assessment included evaluation of the training events as well as a unit-wide assessment that then fed further task development. The manual described nine principles of training to guide direction for training management: train as combined arms teams, train as you fight, use appropriate doctrine, use performance-oriented training, train to challenge, train to sustain proficiency, train using multi-echelon techniques, train to maintain, and make commanders the primary trainers. These principles differed significantly from FM 21-5's fundamentals of military training in that they

[46] US Army, FM 25-101 (1990), 1-1–1-11.

focused on the management of training as opposed to learner-centric concepts for the design of training in the 1940 manual.[47]

The 1990 FM 25-101 directed the execution of training events through three progressive stages. In the first, initial training, units learned about tasks through a lecture, a conference, or, preferably, a demonstration. Next came refresher training, involving execution of tasks to the published standard. Finally, units conducted sustainment training, which added realism and complexity to training events. These later two stages consisted of drills, lane training, competition, or live fire exercises based upon the task and the unit's preparation and familiarity with the subject of the training. FM 25-101 described each of these methods in detail with considerations for their usage. Units were expected to train their collective tasks by executing them under realistic conditions.[48]

The Army established the CTC program to provide realistic training and standardize readiness assessments of units. By 1991, four centers made up the CTC program: the National Training Center, the Joint Readiness Training Center, the Combat Maneuver Training Center, and BCTP. These centers provided both active and reserve forces immersive training environments with trained and professional opposing forces. Additionally, experienced observers provided coaching and assessments throughout the units' performance at the centers. The training conducted at each center exercised all the units' mission essential tasks in the most realistic conditions possible. In this way, the CTC program provided opportunities for units to learn through experience while also providing a means to test their readiness to perform their wartime missions. BCTP was unique from the other centers in that it sent training and evaluation teams to units, enabling headquarters to train collective tasks at their home station in a simulated environment. The other centers had massive maneuver areas for units to employ all their organic

[47] US Army, FM 25-101 (1990), 2-2–3-38.

[48] Ibid., 4-2–4-9.

subordinates as well as Army and joint enablers. The CTC program was the capstone of a unit's training progression.[49]

Training in Practice

The Training Revolution was not an entirely smooth process for the US Army. The transition to performance-oriented training required a significant shift in thought amongst many leaders, but the Training Revolution succeeded in large part because of senior leaders who recognized the value of performance-oriented training and forced it upon an almost unreceptive army. The results of the revolution, though, would be seen in the decades to follow and would prove beyond a doubt the effectiveness of performance-oriented training at achieving its desired outcomes. In application of the Training Revolution in operational units, the themes of the transition to performance-oriented training were readiness and realism.[50]

Readiness was not a new concept, but during the Training Revolution, it took on a new urgency. Previously, readiness was achieved over time as forces were mobilized to meet a threat. The lessons from the 1973 war taught Army leaders that a period of mobilization might not be available in the next war. The training methodology used to build the Army for World War II, then, was no longer feasible. Now, unit readiness would need to be maintained over time so that the Army could win the first fight in the next war, whenever that may be. To achieve this, the Army developed new models to man and train formations.[51]

Manning of formations was improved significantly following a reorganization of the Army in 1972 and 1973. This reorganization included the establishment of both TRADOC and its peer, Forces Command (FORSOM). The purpose of this reorganization was to improve efficiency and effectiveness of training and personnel management. TRADOC was responsible for training

---

[49] US Army, FM 25-101 (1990), D-2.

[50] Geoffrey L. Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979" (master's thesis, Ohio State University, 2010), 107-110.

[51] Ibid.

and educating individuals while FORSCOM was responsible for creating and maintaining combat-ready formations. General William DePuy, the first commander of TRADOC, believed too much education was taking place in operational units, and used his new command to take on responsibility for the development of individuals. This bifurcation of training responsibilities allowed units to focus on collective training. TRADOC created new courses and educational paths for leaders and soldiers to prepare them for the operational force. When individuals arrived in their FORSCOM units, they were expected to be prepared to execute tasks commensurate with their grade and technical specialty. Because TRADOC trained and certified new soldiers, receiving units could treat them as interchangeable parts of the machine-like works of the unit. FORSCOM units did not have to build readiness from scratch, but instead continued to exercise combat systems and processes over time to maintain their readiness.[52]

This binary approach to manning and training did create some issues. As TRADOC's power and influence grew, so did its responsibilities. As the developer of Army doctrine, TRADOC became intrinsically involved in the operations of FORSCOM units. Additionally, TRADOC was charged with specifically how and what to train within FORSCOM units. This created ever-increasing tension between TRADOC and FORSCOM leaders over the decades that followed. Only victory in the deserts of Kuwait and Iraq in 1991 finally proved the effectiveness of the TRADOC-directed reforms.[53]

The Army implemented a new training model in 1977 to improve the effectiveness of unit training. TRADOC created the Army Training and Evaluation Program (ARTEP) to drive adoption of performance-oriented training in operational units. Units could use it to both design

---

[52] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 76-80; Romie L. Brownlee, and William J. Mullen, eds., *Changing an Army: An Oral History of General William E. DePuy, USA Retired* (Washington, DC: US Army Center of Military History, 1979), 186-189.

[53] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 76-80; Brownlee and Mullen, *Changing an Army: An Oral History of General William E. DePuy, USA Retired*, 186-189.

training and evaluate performance. Instead of directing the number of hours a unit should train each task, it identified the performance steps necessary to achieve success at the task. TRADOC created ARTEPs for each type of unit in the Army and every task they were expected to be able to perform. Units could reference these documents to find the supporting sub-tasks for each task, as well as the evaluation standards for each. This systems approach to training viewed unit effectiveness as a function of individual and collective proficiency and weapon system capabilities. The ARTEP methodology established Army-wide standards for measuring unit performance, providing the Army a picture of readiness across the force. The transition to performance-oriented training sought to remove subjectivity from training evaluation, and in doing so relied upon increased realism in training events.[54]

A major theme in the application of the Training Revolution in collective training was improved realism. This not only improved readiness evaluations, but also created a better training experience. The US Navy and Air Force both adopted this concept in aviator training. Analysis of air engagements in the Vietnam War showed that pilots had a forty percent chance of surviving their very first combat engagement, but their odds of victory increased to ninety percent after their tenth combat engagement. The navy and air force instituted schools and exercises in the early 1970s to create realistic combat experiences so that those first ten engagements would occur in training, giving their pilots better odds in actual conflict. During the Training Revolution, the Army made several efforts to increase the realism of collective training to achieve similar results. The most effective improvement in realism was in the form of tactical engagement simulators.[55]

---

[54] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 76, 80-88; Paul F. Gorman, *The Military Value of Training* (Alexandria, VA: Institute for Defense Analysis, 2000), 43-44.

[55] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 102-104; US Department of the Air Force, *Gulf War Air Power Survey, Vol IV: Weapons, Tactics, and Training and Space Operations* (Washington, DC: Government Printing Office, 1993), 421-436.

Technology enabled a new level of realism in training. Before the reforms of the 1970s, maneuver exercises required adjudication by umpires who accompanied and observed the actions of units. These umpires followed rules and made assumptions regarding the outcome of engagements between different forces. The most realistic training up to this point was live fire training, but safety considerations imposed constraints on realism. For example, live-fire training was always scripted. Though the training unit may not know the script from start to finish, the target array had little ability to react to the unit's actions. Thus, units did not experience a fight against a thinking enemy. To rectify this, in 1974 the Army unveiled its first tactical engagement simulation system: REALTRAIN.

This system still required umpires but removed subjectivity from their assessments. Each soldier and vehicle wore a visible, numbered card, and each weapon system was equipped with an optic that allowed the user to read the card from as far away as the maximum effective range of that system. Umpires then adjudicated "hits" when a soldier reported the proper designation of his target. This system proved incredibly effective. Testing showed that units conducting training with REALTRAIN improved their tactical performance by seventy-five percent more than units using more conventional training techniques. Infantry squads trained with REALTRAIN grew more effective at detecting the enemy and using concealment, had better internal communication, and demonstrated improved initiative. The realism of the training system resulted in better training, and better-performing units. The REALTRAIN system, though, still required a high overhead cost for training exercises in the form of umpires that would accompany each separate maneuver element. The next generation of tactical engagement simulators would eliminate the overhead and increase realism even further.[56]

---

[56] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 90-97; James H. Banks, Guthrie D. Hardy, Thomas D. Scott, Garry Kress, and Larry E. Wood, *REALTRAIN Validation for Rifle Squads: Mission Accomplishment* (Arlington, VA: US Army Research Institute, 1977), 2-20; R. T. Root, C. Mazie Knerr, Angelo A. Severino, and Larry E. Word, *Tactical Engagement Simulations Training: A Method for Learning the Realities of Combat* (Alexandria, VA: US Army Research Institute, 1979), 10-15; Thomas D. Scott, James H. Bank, Guthrie D. Hardy, and Robert H.

In 1979, the Army began experimenting with the Multiple Integrated Laser Engagement System (MILES). This system consisted of weapon-mounted lasers with receivers on personnel and equipment that could detect "hits" from the lasers and "kill" the wearer. This system was significantly more expensive than the REALTRAIN system but reduced the overhead necessary in the form of umpires, and therefore was found to make the overall training of units less expensive. This system had the largest impact on the adoption of performance-oriented training as it removed almost all subjectivity from exercises. Anyone could be killed, and units had to react accordingly. By realistically replicating the effects of weapon systems, units could now exercise all their functions in a fully immersive environment. This increased realism enabled improved readiness across the force.[57]

Despite improved realism and readiness, friction continued to affect the Training Revolution. Some senior leaders believed the increased realism detracted from the training outcomes, as leaders and whole formations could "die" too early to complete the task. TRADOC leadership, though, argued that this was the point. If a unit could not accomplish a task under realistic conditions, the unit was not trained sufficiently to accomplish that task. Additionally, the creation of the CTC program in 1982 caused further concern for some leaders. Senior Army leaders advocated for decentralized training, where unit commanders were held responsible for their unit's readiness. Some felt that the requirement for units to participate in a centralized evaluation of their performance at a place like the CTCs reduced the commander's role and responsibility. TRADOC continued to argue the validity of centralized exercises as an ability to not only evaluate readiness, but also test and experiment Army-wide concepts and doctrine.[58]

Sulzen, *REALTRAIN Validation for Rifle Squads III: Tactical Performance During Movement-to-Contact* (Arlington, VA: US Army Research Institute, 1979), 4-5.

[57] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 97-102; Root et al., *Tactical Engagement Simulations Training: A Method for Learning the Realities of Combat*, 10-15; Gorman, *The Military Value of Training*, 16.

[58] Earnhart, "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979," 102-107; Anne W. Chapman, *The Origins and Development of the National Training Center,*

The greatest impact of the Training Revolution was a cognitive shift in the conceptualization of training. Readiness was no longer something to be achieved through training by a certain point in time, but instead something to be maintained over time through realistic exercises. Unit collective training became performance-oriented and allowed commanders the flexibility to develop their formations as appropriate to gain and maintain combat readiness. The true outcome of the Training Revolution is most evident in the success of the US Army in the deserts of Kuwait and Iraq in both 1991 and 2003. Army units entered combat on short-notice and performed well within the standards prescribed in the respective ARTEPs for the tasks they performed.

Analysis

The Army's doctrine developed during the Training Revolution was much more focused and prescriptive than previous training doctrine. In its effort to focus on immediate readiness, the Army needed its doctrine to prescribe specific, reportable training for units. With the establishment of TRADOC, the Army moved the locus for the transfer of declarative knowledge outside of units. This allowed units to focus on response strengthening in the form of exercises and practice. In this way, collective training became an opportunity to learn warfighting as a combination of psychomotor skills like gunnery and battle drills, and intellectual skills like planning and targeting. While the training still had much in common with behavioral conditioning, the doctrine emphasized learning cognitive actions associated with various physical outputs. In this way, the doctrine primarily embraced a cognitivist learning theory while relying upon behaviorist-style methodologies to build and maintain readiness.

Unlike mobilization for World War II, the execution of training during the Training Revolution remained in step with the corresponding doctrine. The Army wrote training doctrine

---

1976-1984 (Washington, DC: US Army Center of Military History, 1992), 33-55; Robert M. Citino, *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare* (Lawrence: University of Kansas Press, 2004), 274.

specifically for the context of the time, improving the match of doctrine to practice. Instead of treating warfighting as a psychomotor task, units trained their collective tasks as intellectual skills, and viewed planning and execution as problem-solving experiences. Repetition created opportunities for response strengthening, where the validity of the doctrinal processes was reinforced. Similarly, new training technologies created improved realism that further strengthened the learning occurring at echelon during collective training.

The training conducted during the Training Revolution set conditions for successful conventional operations in Iraq during both the 1991 and the 2003 wars. Collective training developed intellectual skills that allowed units to achieve an unprecedented level of efficiency in each of these wars. Still, these methodologies had their limitations. In outsourcing information acquisition to TRADOC and focusing almost exclusively on response strengthening in unit training, doctrine, and practice did not set conditions for collective, learning organizations. This limited the ability for units to respond to changing conditions in the post-9/11 wars. The training methodologies of the Training Revolution met and exceeded expectations for the context of their time, but showed limited ability to adapt to changing conditions.

Training for the Next War

Beginning in 2014 with the publication of a new operating concept, *AOC*, *2020-2040,* the US Army began a major shift in its approach to operations. After nearly thirteen years of continual conflict, the Army recognized operational shortcomings for the perceived future operating environment. Recently released operational doctrine emphasizes the human, cultural, and political continuities of armed conflict. It asserts that winning in the future operational environment's decentralized operations will require adaptive leaders, cohesive teams, and resilient soldiers that thrive in conditions of uncertainty. To prepare for future operations, the

Army has prioritized the development of leaders that thrive in a complex environment against adaptive threats.[59]

The condition of the force today is unique. Conventional US forces have been engaged in combat for over sixteen years, creating a wealth of experience across the Army. The nature of this experience, though, has centered on counterinsurgency operations. Current operational doctrine anticipates future large-scale combat operations against peer and near-peer threats. While most mid-grade and senior-level leaders have combat experience, some of the insights drawn from recent conflicts could lack relevance in the next war. Thus, the Army must incorporate training for large-scale combat while retaining the capability to perform stability operations. Additionally, today's soldier differs from those of previous generations. New members of the Army have more education than ever before, but they have a harder time attaining physical fitness requirements and suffer far more physical injuries from training than their predecessors did. Further, while new soldiers are technology-literate, many are technology-dependent as well. Thus, units and trainers face new challenges in the effort to create an expeditionary force capable of operating in austere, complex environments.[60]

Current Training Doctrine

Current Army doctrine maintains several continuities with the training doctrine developed during the Training Revolution. It recognizes that units conduct training with a battle focus to build and maintain combat readiness while developing subordinate leaders. Unit collective training reinforces foundations established during institutional training while introducing additional skills to support the unit's mission to achieve combat readiness. Leader development is a continuous and progressive process that occurs throughout a leader's career. In

[59] US Army, *The US Army Operating Concept: Win in a Complex World, 2020-2040*, 2-3, 10-12, 16-20; US Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, 2017), 1-2–1-6, 2-52–2-55.

[60] US Army, FM 3-0 (2017), 1-1–1-12, 2-52–2-55.

this way, a unit is responsible not just for preparing for combat, but also managing each soldiers' career progression.[61]

Field Manual (FM) 7-0, *Train to Win in a Complex World*, is the Army's effort to change the training methodology of units to prepare them for large-scale scale combat operations. Released in 2016, it accounts for new and emerging operational doctrine. It describes the requirements of training environments to match anticipated future operational environments. FM 7-0 presents ten principles of training: train as you fight, training is commander driven, training is led by trained officers and noncommissioned officers, train to standard, train using appropriate doctrine, training is protected, training is resourced, train to sustain, train to maintain, and training is multi-echelon and combined arms. Additionally, it defines the process and standards for assessing readiness, which it makes the focal point for all training. In doing so, the document emphasizes training management to achieve defined measures of readiness.[62]

The proportion of the document devoted to different topics illustrates this focus. Out of 154 pages of content in FM 7-0, over 49% addresses the administration and management of unit training plans. This includes 48 pages describing the process of developing a plan, 17 pages dedicated to the various meetings, and briefings related to training management, and 11 pages addressing inspection and supervision of training programs. Only 16% of the manual, or 26 pages, provides an overview of training, including the purpose, principles, and desired outcome of training. The remaining 35% of the manual address actual training events. Of this, though, 18 pages focus on assessments to inform readiness reporting. Only 34 pages of the manual describe

[61] US Army, ADRP 7-0 (2012), 1-1–1-2.

[62] US Department of the Army, Field Manual (FM) 7-0, *Train to Win in a Complex World* (Washington, DC: Government Printing Office, 2016), 1-1–1-11.

the conduct of training, including 10 pages on after-action reviews and 17 on the specifics of lane training.[63]

Interestingly, training considerations do appear in operational doctrine. To help support a change in focus across the Army, the newest FM 3-0, *Operations*, has an entire section on training for large-scale combat operations. To reinforce the necessity of changing focus, it includes two vignettes on the value of training and readiness. It also presents specific training considerations for each warfighting function. These considerations contain descriptions of necessary friendly capabilities as well as anticipated threat capabilities for future conflicts. It does not, however, elaborate on how to incorporate these considerations into training. There is brief mention of different training techniques, but it lacks detail needed to inform the design of training events. Most of the discussion of training techniques focuses on CTC rotations, which provides little to a planner designing unit training.[64]

Guidance on leader development is found throughout Army doctrine, due to the nature of development occurring across three learning domains: institutional, operational, and self-developmental. To support units in designing leader development programs, doctrine provides seven principles of leader development: lead by example, develop subordinate leaders, create a learning environment for subordinate leaders, train leaders in the art and science of mission command, train to develop adaptive leaders, train leaders to think critically and creatively, and train your leaders to know their subordinates and their families. Doctrine further defines each of these principles but offers few techniques to apply them to training.[65]

---

[63] US Army, FM 7-0 (2016), 2-23–2-27. The section on lane training is the only part of the manual that describes a specific training technique—a significant departure from previous training doctrine.

[64] US Army, FM 3-0 (2017), 2-52–2-63. The manual describes the importance of an integrated approach consisting of live, virtual, and constructive training, with a focus on multi-echelon training, but only briefly.

[65] US Army, ADRP 7-0 (2012), 2-4–2-5.

Analysis

Current Army training doctrine is a logical continuation of the Training Revolution doctrine in that it continues to emphasize readiness through training, although it does not describe how to enable learning during training. The assessment measurements and readiness requirements in FM 7-0 do not assist in creating opportunities for learning. Instead, doctrine presents training as a process of performing a task to a prescribed standard, and once the task has been completed, the unit may move on to the next task. It assumes that by performing the task, any necessary learning must take place somewhere, somehow. The doctrine ignores any aspects of individual or collective information acquisition or knowledge construction, and instead relies purely on response strengthening. In this way, the current FM 7-0 continues just like the behaviorist traditions of the Training Revolution without the cognitivist components that made the revolution so successful.

This continuation of methodologies from the Training Revolution also fails to account for changes to Army operational concepts and context. The number of required tasks a single organization must accomplish far exceeds that of a similar unit from the late 1980s. Similarly, senior leaders anticipate far greater complexity in the future operational environment than ever experienced in the past. Current training doctrine does not account for these changes, nor does it provide a methodology for units to adapt their training to meet future challenges. Additionally, the linkages between the institutional and operational forces have evolved since the Training Revolution. A 2013 RAND study found no systemic processes to integrate unit training and institutional leader development programs across the force. Each of these issues limits the effectiveness of future training. To fully prepare Army forces for the challenges of tomorrow,

training doctrine and methodologies must be tied to the specific operational concepts and context of the next war.[66]

Opportunities for the Future

To build and maintain a qualitative advantage on the battlefield, the Army relies on both superior technology and better-prepared soldiers. The Army can only achieve this level of readiness through deliberate development of the cognitive capabilities of its soldiers and leaders at all levels. Unit collective training is a critical component of this effort; it facilitates learning at both the individual and collective levels. Learning occurs as a combination of response strengthening, information acquisition, and knowledge construction. In the mobilization for World War II, the Army used training methodologies built on humanist and behaviorist learning theories to rapidly build a combat-effective force capable of dominating the globe. In the Training Revolution, the Army used methodologies incorporating cognitivist theories to create a professional, problem-solving force, and behaviorist-informed methodologies that created a "fight tonight" mentality and capability across the force. Current doctrine, though, has carried forward only the behaviorist methodologies of past training experiences. This limits units' abilities to grow and learn as a part of training.

To prepare our forces for the next conflict, our training doctrine must set conditions for learning during collective training. Different tasks may require different training methodologies, informed by different learning theories. The examples of mobilization and the Training Revolution show the effectiveness of behaviorism and cognitivism, but neither approach is as useful individually as it is in conjunction with others. Thus, a blended approach will generate the best learning experiences during training. That said, to best align with our current concepts and context, constructivism must inform the Army's future training methodologies. In constructivism,

[66] James C. Crowley, Michael G. Shanley, Jeff Rothenberg, and Jerry M. Sollinger, *Adapting the Army's Training and Leader Development Programs for Future Challenges* (Santa Monica, CA: Arroyo Center/RAND Corporation, 2013), 85-86.

people learn by constructing meaning from their experiences. In broader social constructivism, learning occurs not just from a person's own experiences, but also from the collective experience of the group. Unit collective training informed by constructivism would emphasize not just accomplishment of a training task, but deliberate construction of new knowledge and understanding from experiences. Additionally, this would better prepare individuals and units to learn while operating, which is an important and necessary skill within the construct of *AOC 2020-2040*.

The Army embraced learning to prepare itself for the anticipated demands of the dynamic and complex world anticipated in *AOC 2020-2040*. To achieve a blending of the continuum of learning between training and education, unit collective training must be informed by doctrine grounded in learning theory. Training methodologies must tie desired outcomes to activities through evidence-based research. Additionally, the institutional and operational forces must have deliberate ties between individual and collective training through learning experiences. The Army has previously revised training methodologies when transitioning to new operating concepts, and it is time to again revise training doctrine to prepare the force for a complex world. Incorporating constructivist approaches to the design of training experiences would create better opportunities for learning in unit collective training.

Bibliography

Adams, Barbara D., Robert D. G. Webb, Harry A. Angel, and David J. Bryant. *Development of Theories of Collective and Cognitive Skill Retention*. Toronto, ON: Defence Research and Development Canada, 2003.

Argote, L. *Organizational Learning: Creating, Retaining, and Transferring Knowledge*. New York: Springer Science and Business Media, 2013.

Ayotte, John U. "Battle Training (Part One)." *Infantry Journal* 52, no. 3 (March 1943): 67-71.

———. "Battle Training (Part Two)." *Infantry Journal* 52, no. 4 (April 1943): 62-65.

Banks, James H., Guthrie D. Hardy, Thomas D. Scott, Garry Kress, and Larry E. Wood. *REALTRAIN Validation for Rifle Squads: Mission Accomplishment*. Arlington, VA: US Army Research Institute, 1977.

Bailey, Beth. *America's Army: Making the All-Volunteer Force*. Cambridge, MA: Harvard University Press, 2009.

Brownlee, Romie L., and William J. Mullen, eds. *Changing an Army: An Oral History of General William E. DePuy, USA Retired*. Washington, DC: US Army Center of Military History, 1979.

Bonura, Michael A. *Under the Shadow of Napoleon: French Influence on the American Way of Warfare from the War of 1812 to the Outbreak of WWII*. Warfare and Culture Series. New York: New York University Press, 2012.

Calhoun, Mark T. *General Lesley J. McNair: Unsung Architect of the U.S. Army*. Lawrence: University Press of Kansas, 2015.

Chapman, Anne W. *The Army's Training Revolution, 1973-1990*. Washington, DC: US Army Center of Military History, 1994.

———. *The Origins and Development of the National Training Center, 1976-1984*. Washington, DC: US Army Center of Military History, 1992.

Citino, Robert M. *Blitzkrieg to Desert Storm: The Evolution of Operational Warfare*. Lawrence: University of Kansas Press, 2004.

Collins, Arthur S. *Common Sense Training: A Working Philosophy for Leaders*. San Rafael, CA: Presidio Press, 1978.

Crowley, James C., and Bryan W. Hallmark. *Company Performance at the National Training Center*. Santa Monica, CA: Arroyo Center/RAND Corporation, 1993.

Crowley, James C., Michael G. Shanley, Jeff Rothenberg, and Jerry M. Sollinger. *Adapting the Army's Training and Leader Development Programs for Future Challenges*. Santa Monica, CA: Arroyo Center/RAND Corporation, 2013.

Doughty, Ralph, Linton Wells, and Theodore C. Hailes, eds. *Innovative Learning: A Key to National Security*. Fort Leavenworth, KS: The Army Press, 2015.

Downing, Wayne A. "Training to Fight." *Military Review* 66, no. 5 (May 1986): 18-27.

Earnhart, Geoffrey L. "Winning the First Battle: The Foundation of the U.S. Army's Training Revolution, 1973-1979." Master's thesis, Ohio State University, 2010.

Fletcher, J. D., and P. R. Chatelier. *An Overview of Military Training*. Alexandria, VA: Institute for Defense Analyses, 2000.

Gorman, Paul F. *The Military Value of Training*. Alexandria, VA: Institute for Defense Analysis, 2000.

Hoyt, Edwin P. *The GI's War: American Soldiers in Europe During World War II*. New York: Cooper Square Press, 2000.

Johnson, Burke. *Educational Research: Quantitative, Qualitative, and Mixed Approaches*. 5th ed. Thousand Oaks, CA: Sage Publications, 2014.

Kahan, James P., D. Robert Worley, Suzanne M. Holroyd, Leland C. Pleger, and Cathleen Statsz. *Implementing the Battle Command Training Program*. Santa Monica, CA: Arroyo Center/RAND Corporation, 1989.

Kennedy, David M. *The Oxford History of the United States*. Vol. 9, *Freedom from Fear: the American People in Depression and War, 1929-1945*. New York: Oxford University Press, 1999.

Mansoor, Peter R. *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945*. Modern War Studies. Lawrence: University Press of Kansas, 1999.

Matchett, H. J. "Let's Teach Battlefield Training." *Infantry Journal* 58, no. 1 (January 1946): 50.

Mayer, Richard E. *Applying the Science of Learning*. Boston, MA: Pearson/Allyn & Bacon, 2011.

Mayer, Richard E. "Learning." In *Encyclopedia of Educational Research*, 1040. New York: The Free Press, 1982.

McGilvray, David H., Bruce C. Leibrecht, and Karen J. Lockaby. *Measuring Learning and Performance in Collective Training Exercises*. Washington, DC: US Army Research Institute, 2008.

Meliza, Larry L., and Bruce W. Knerr. *Early Training Strategy Development for Individual and Collective Training*. Washington, DC: US Army Research Institute, 1991.

Merriam, Sharan B., and Laura L. Bierema. *Adult Learning: Linking Theory and Practice*. The Jossey-Bass Higher and Adult Education Series. San Francisco, CA: Jossey-Bass, a Wiley Brand, 2014.

Morgan, Ben B., Glynn D. Coates, Earl A. Alluisi, and Raymond H. Kirby. *Team-Training Load as a Parameter of Effectiveness for Collective Training in Units*. Washington, DC: US Army Research Institute, 1978.

Reimer, Dennis J. “Training: Our Army’s Top Priority.” *Military Review* 76, no. 4 (September-October 1997): 71-74.

Rigg, Robert B. *Realistic Combat Training and How to Conduct It*. Harrisburg, PA: The Military Service Publishing Co., 1955.

Romjue, John L. *American Army Doctrine for the Post-Cold War*. Washington, DC: Center of Military History, 1997.

Romjue, John L, Susan Canedy, and Anne W. Chapman. *Prepare the Army for War: A Historical Overview of the Army Training and Doctrine Command, 1973-1993*. Fort Monroe, VA: Office of the Command Historian, Training and Doctrine Command, 1993.

Root, R. T., C. Mazie Knerr, Angelo A. Severino, and Larry E. Word. *Tactical Engagement Simulations Training: A Method for Learning the Realities of Combat*. Alexandria, VA: US Army Research Institute, 1979.

Root, R. T., K. I. Epstein, F. H. Steinheiser, J. F. Hayes, S. E. Wood, R. H. Sulzen, G. G. Burgess, A. Mirabella, D. E. Erwin, and E. Johnson III. *Initial Validation of REALTRAIN with Army Combat Units in Europe*. Arlington, VA: US Army Research Institute, 1976.

Santrock, John W. *Essentials of Life-Span Development*. 3rd ed. New York: McGraw-Hill, 2014.

Schifferle, Peter J. *America’s School for War: Fort Leavenworth, Officer Education, and Victory in World War II*. Lawrence: University Press of Kansas, 2010.

Scott, Thomas D., James H. Bank, Guthrie D. Hardy, and Robert H. Sulzen. *REALTRAIN Validation for Rifle Squads III: Tactical Performance During Movement-to-Contact*. Arlington, VA: US Army Research Institute, 1979.

Smith, Patricia L., and Tillman J. Ragan. *Instructional Design*. 3rd ed. Wiley-Jossey-Bass Education. Hoboken, NJ: J. Wiley & Sons, 2005.

US Army. Field Manual 21-5, *Military Training*. Washington, DC: Government Printing Office, 1941.

US Department of the Air Force. *Gulf War Air Power Survey, Vol IV: Weapons, Tactics, and Training and Space Operations*. Washington, DC: Government Printing Office, 1993.

US Department of the Army. *Army Learning Strategy*. Fort Leavenworth, KS: Army University Press, 2017.

———. Army Doctrinal Reference Publication 7-0, *Training Units and Developing Leaders*. Washington, DC: Government Printing Office, 2012.

———. Army Regulation 350-1, *Army Training and Leader Development*. Washington, DC: Government Printing Office, 2014.

———. *Army Training Strategy*. Washington, DC: Government Printing Office, 2012.

———. *Army Training Study Final Report*. Washington, DC: Government Printing Office, 1978.

———. *Enhancing Realistic Training White Paper*. Fort Leavenworth, KS: Army University Press, 2016.

———. Field Manual 3-0, *Operations*. Washington, DC: Government Printing Office, 2017.

———. Field Manual 7-0, *Train to Win in a Complex World*. Washington, DC: Government Printing Office, 2016.

———. Field Manual 21-5, *Military Training*. Washington, DC: Government Printing Office, 1950.

———. Field Manual 21-6, *Military Training*. Washington, DC: Government Printing Office, 1975.

———. Field Manual 25-4, *How to Conduct Training Exercises*. Washington, DC: Government Printing Office, 1984.

———. Field Manual 25-100, *Training the Force*. Washington, DC: Government Printing Office, 1988.

———. Field Manual 25-101, *Battle Focused Training*. Washington, DC: Government Printing Office, 1990.

———. Training and Doctrine Command Pamphlet 525-3-1, *The US Army Operating Concept: Win in a Complex World, 2020-2040*. Washington, DC: Government Printing Office, 2014.

———. Training and Doctrine Command Pamphlet 525-3-7, *US Army Human Dimension Concept*. Washington, DC: Government Printing Office, 2014.

———. Training and Doctrine Command Pamphlet 525-8-2, *US Army Learning Concept for Training and Education, 2020-2040*. Washington, DC: Government Printing Office, 2017.

———. *Understanding Learning Transfer: How Creating a Climate for Learning Transfer Can Enable Intellectual Optimization*. Fort Leavenworth, KS: Army University Press, 2016

US Department of Defense. *Training for Future Conflicts Final Report*. Washington, DC: Government Printing Office, 2003.

Wiley, Bell I. Army Ground Forces Study No. 11: *Training in the Ground Army, 1942-1945*. Washington, DC: Army Ground Forces Historical Section, 1946.

———. Army Ground Forces Study No. 12: *The Building and Training of Infantry Divisions*. Washington, DC: Army Ground Forces Historical Section, 1946.

———. Army Ground Forces Study No. 13: *Activation and Early Training of "D" Division*. Washington, DC: Army Ground Forces Historical Section, 1948.

Zacharakis, Jeffrey, and Cheryl Jean Polson, eds. *Beyond Training: The Rise of Adult Education in the Military*. Jossey-Bass Higher and Adult Education Series. San Francisco: Jossey-Bass, 2012.