

**Learning Beyond the Buzzwords:
Developing the Adaptable, Competent CSS Soldier**

**A Monograph
by
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Abstract

LEARNING BEYOND THE BUZZWORDS: DEVELOPING THE ADAPTABLE, COMPETENT CSS SOLDIER by MAJ Sydney A. Smith, US Army, 60 pages.

This monograph examines junior CSS soldier training programs against current learning theory in order to determine how the Army should structure its institutional and self-development programs to optimally develop Combat Service Support (CSS) soldiers to be adaptable, tactically and technically competent, and able to perform in any environment throughout today's battlefield. To accomplish this task, this work employs classic problem analysis. First, current and future requirements of a CSS soldier are identified by delving into concept papers, future doctrine, and current operations (specifically, Operation Enduring Freedom, or OEF, and Operation Iraqi Freedom, or OIF). The second step surveys psychological aspects of learning in order to identify criteria for developing programs to effectively train CSS soldiers. This section covers major current theories of learning (including behaviorism, constructivism, and other theories applicable to adult learning) and attempts to derive holistic guidelines from seemingly divergent sometimes narrow theories. The paper next investigates two potential training models, the current institutional and self-development program for Unit Supply Specialists, and a proposal developed by the Army Research Institute to train the future multi-skilled CSS soldier. The models are compared with the established learning criteria to determine strengths and weaknesses. The paper finds that current and proposed training models employ a behavioral emphasis that is suitable for training technical and tactical competence, but is less appropriate for developing flexible, adaptable junior leaders. The programs also strongly encourage self-development through distance learning, but do not clearly articulate the purpose of self-development, or ensure available training programs are effective means to achieve that purpose. To foster adaptability in its junior CSS soldiers, the Army must embrace a culture that views life-long learning as essential (not just a block to be checked), modify training policy to focus on developing effective rather than merely trained soldiers, ensure instructors are trained to employ interactive, learner centered instructional techniques, and provide appropriate time to achieve learning goals.

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CHAPTER ONE

Soldier of the Future, or Soldier of Today?

SPC Gilhooly, a supply specialist, prepares to help her unit deliver supplies to an infantry unit on the other side of the city. She is the best machine gunner in her company, so she mans the convoy's gun truck. Although the supply convoy chooses its route carefully to avoid likely ambush sites, all of a sudden a vehicle blocks the road ahead and insurgents begin firing. SPC Gilhooly lays down suppressive fire while her fellow supply soldiers clear the ambush and defeat the enemy. SPC Gilhooly, a combat lifesaver, provides first aid to a fellow soldier who received minor wounds, and they continue down their route. When they arrive at their destination, SPC Gilhooly is asked to accompany the infantry unit on a raid. They will be searching private homes and need her to help search the women. SPC Gilhooly makes the local women more comfortable during the search, and they talk freely while she is there. Because she knows some of the local language, she listens to the women reveal the location of a known insurgent. She passes the information on and returns with her unit to the supply base. She reports to work to discover that the computerized supply database is corrupted. She is able to confer with experts in the United States via the Internet, and in a short time restores the system with no loss of data.

Introduction

Recent visions of warfare have often involved a picture of the robo-soldier: the soldier, who, with his body armor, weapon system, night vision goggles, and miniature computer, is able to absolutely understand and completely control his environment. He is always professional, violent when necessary, and yet perfectly moral; he commands his superbly athletic body and his nuanced quick mind unfailingly to achieve his goals, which consistently remain true to his superiors and the people of the United States.

In the picture of the future robo-soldier, his face is unclear, hidden by a helmet and a miniature computer optic. The artist creating this vision does this deliberately, to sell a grand concept and image. But behind the ethereal exterior of that soldier is a real person: a young man or woman raised (most likely) in America, the product of American culture and schools, with both the strengths and weaknesses embedded in the human race and American society. Because he is human, he is imperfect. He does not always remember things perfectly. His judgment is based on his own experiences and beliefs. His body is subject to injury, age, and imperfect control. Some things he does, he finds fascinating; other things are quite boring. He has natural strengths and natural weaknesses, and although he may continually try to improve himself, he will never overcome his own humanity.

This paper will attempt to provide links to bridge the gap between the requirements of the current and future soldier, and the human factors that impact his capability to achieve. Specifically, this work will address the question of how the Army should structure its institutional and self-development programs to optimally develop Combat Service Support (CSS) soldiers to be the adaptable, tactically and technically competent, national representatives that future concept papers and the current world environment call for. This question is critically relevant, as the Army comes to recognize that current and future conflicts cannot be solved simply through expert control of weapon systems that enable superior maneuver or attrition, but that individual human actions will become overwhelmingly decisive. In addition, there is a clear realization that CSS soldiers cannot just be outstanding technicians who merely provide materiel and services in the relative safety of a secure rear area, but are an essential part of the total force, interwoven throughout the battlefield, who must be able to operate in dangerous environments while protecting themselves and their missions, and whose individual actions can impact the strategic situation as greatly as any combat infantryman or senior leader.

To accomplish this task, this work will employ classic problem analysis. The first step is to identify the future requirements of a CSS soldier by delving into concept papers and future

doctrine. A subsequent examination of CSS activities in current operations (specifically, Operation Enduring Freedom, or OEF, and Operation Iraqi Freedom, or OIF) will discern similar requirements for current force soldiers.

The second step will branch out of the purely military realm, and survey psychological aspects of learning in order to identify criteria for developing programs to train CSS soldiers to meet requirements. This section will cover major current theories of learning and attempt to derive holistic guidelines from seemingly divergent, sometimes narrow theories. This portion of the work will be written under the expert guidance of Dr. Barbara Smith, practicing school psychologist.

After determining appropriate learning criteria, the paper will investigate two potential training models. To narrow the focus, and because even the most junior soldier's action can have strategic consequences, this work will look specifically at junior CSS soldier institutional and self-development training programs. The first model is the current program used to train Unit Supply Specialists, developed by the Quartermaster Center and School under the guidelines set forth by the US Army Training and Doctrine Command (TRADOC). The next model is a proposal developed by the Army Research Institute to train the future multi-skilled CSS soldier. The models will be compared with the established learning criteria to determine strengths and weaknesses.

The final section will compare the two potential models to determine the most appropriate for our Army. This paper will end with a short look at Leadership, Training, and Personnel implications.

The Soldier of the Future

SPC Gilhooly, as illustrated in the initial fictional vignette, is the combat service support soldier of the future. Joint, Army and independent concept papers each identify a slightly

different, but similar, view of the future soldier. A comparison of the documents paints a clear picture of the characteristics and requirements for the future soldier.

The Way Ahead, the Army Chief of Staff's vision, places the soldier in the center of transformation efforts. This view calls on the soldier to be able to conduct missions ranging from major combat operations to humanitarian assistance in uncertain environments, faced with an unpredictable threat.¹ The soldier, "flexible, adaptive, and competent, infused with the Army's Warrior Culture", will fight wars and win the peace. They will be "possessed of a fierce warrior ethos and spirit, fight in close combat, dominate key assets and terrain, decisively end conflicts, control the movement of people, protect resource flows, and maintain post-conflict stability".² This soldier will be trained at one standard, regardless of specialty. General Peter Schoomaker, Chief of Staff of the Army, unequivocally demands that all soldiers be able to perform combat functions and be a "rifleman first".³ He placed the soldier at the top of his focus areas, demanding that the Army "develop flexible, adaptive and competent soldiers with a warrior ethos".⁴

The *Joint Operating Environment – Into the Future (JOE)*, a concept paper maintained by Joint Forces Command, also describes an uncertain future requiring adaptable soldiers for victory. The paper depicts future combat as possessing

Greater intensity, increased tempo...interrelationships, and interdependencies, and greater uncertainty that place increased value on the human rather than the technological dimension. Such combat will also have greater psychological and emotional impact. It will require greater teamwork at all levels across the entire joint force and will place significant demands on individual and unit discipline. Integrated, close combat will require mature leaders – mentally and physically tough – with superb cognitive and reasoning skills who are masters of tactical warfighting calculus. In short, the playing field has changed and the players must adapt.⁵

¹Department of the Army, *The Way Ahead*,(Washington, DC: Army Strategic Communications, n. d.), 2, available from <http://www.army.mil/thewayahead>. Accessed September 29, 2004.

² Ibid., 7.

³ Sean Naylor, "Chief of Staff to Soldiers: You're a Rifleman First", *Army Times*, Oct 20, 2003, available from <http://freerepublic.com/focus/f-news/1001422/posts>. Accessed September 29, 2004.

⁴ *The Way Ahead*, 15.

⁵ United States Joint Forces Command, *The Joint Operational Environment – into the Future* (Norfolk, VA: Headquarters, United States Joint Forces Command, March 2004), 114.

According to the JOE, the future will require human capabilities much greater than what our soldiers are capable of today. An increasingly complex and chaotic environment that constantly changes will require future leaders to be (among other things) intellectually agile, able to make fast, effective decisions, able to multi-task, and culturally aware.⁶ While the JOE specifically identifies leaders as needing these characteristics, the importance of the strategic corporal in future combat⁷ suggests that all soldiers have these skills.

US Army Training and Doctrine Command (TRADOC) Pamphlet 525-4-01, *US Army Distribution Operations for the Future Force*, describes the future as related to the combat service support soldier. It envisions threat to logistics units coming from small-scale operations against facilities and extended lines of communication (LOCs). The adversary will not be easily identifiable, the battle space will not be clearly defined, and LOCs will be extremely long and vulnerable.⁸ The logistics structure will be reduced and have a smaller footprint. Logistics operations will be more adaptable and dynamic than today, and will require “dramatically improved tactical competency for logisticians”.⁹ Logisticians will track supplies through a global information grid. They will support widely varying combined arms teams, requiring CSS soldiers to be multi-skilled and capable of providing support to multiple weapons systems.¹⁰ In short, future CSS soldiers must be tactically competent and able to defend themselves, technically savvy, and able to work on a myriad of systems.

The RAND publication, *New Challenges, New Tools for Defense Decisionmaking*, considers different visions of future forces, and identifies a common requirement of versatility and leadership. The future soldier may be a Cyber Soldier (entrusted with the decision to fire

⁶ Ibid., 156.

⁷ Dan French, “Canadian – US Staff Talks Observations and Insights from OIF/OEF”, PowerPoint presentation, May 21 2004, Center for Army Lessons Learned, Fort Leavenworth, KS, slide 5.

⁸ TRADOC Pamphlet 525-4-01, *US Army Distribution Operations for the Future Force, Final Draft* (Fort Monroe, VA: Headquarters, TRADOC, June 21, 2004), 25.

⁹ Ibid., 12.

¹⁰ Ibid., 13.

costly weapons and operating in a stealthy fashion); an Information Warrior (an expert in hardware and software, able to develop a detailed knowledge of the adversary's vulnerabilities); conducting peace operations (capable of handling several small-to-medium contingencies at any given time); or in a Rapid Response Force (able to deploy on a short notice, with efficient, flexible and lean logistics capabilities).¹¹ Despite their differences, these visions have in common a need for personnel "who can learn rapidly, reach high levels of competence, adapt in the face of uncertainty, and apply a variety of skills in difficult circumstances."¹²

Meshing these visions then, one can start to apply some definition to the buzzwords of the "flexible, adaptive soldier" and identify the common characteristics required of the future CSS soldier:

- Able to work across the full spectrum of operations, from humanitarian assistance to major combat
- Tactically competent and able to protect himself against an unpredictable, not easily identifiable adversary
- Able to incorporate rapidly changing technology into his existing skill set
- Able to work on a variety of systems; not limited to one narrow technical specialty
- Culturally aware; able to interact positively with the local population

The Soldier of Today

Identifying requirements for a future soldier implies that those requirements are different from those needed by the CSS soldier of today. Certainly, even a few years ago a CSS soldier could enlist expecting to become a technical expert in a narrow field. Lieutenant General William Wallace, commander of the Combined Arms Center at Fort Leavenworth, KS, told

¹¹ James Hosek, "The Soldier of the 21st Century", in *New Challenges, New Tools for Defense Decisionmaking*, ed. Stuart Johnson, Martin Libicki, and Gregory F. Treverton, (Santa Monica, CA: RAND Publications, 2003), 183-184.

¹² *Ibid.*, 181.

reporters in 2003, “In our well-intentioned direction of trying to develop very technically competent soldiers in branches of the service, perhaps we lost some of the edge associated with being a soldier.”¹³ Many logisticians viewed soldier field training as a mandatory block to be checked, a necessary detractor from the real mission of providing sustainment support to their “customers”, other units conducting training or missions. The push for logistics efficiency throughout the 1990s may have contributed to this attitude, as CSS units measured their performance against hard metrics that measured how long it took a customer unit to receive an item requested through the CSS system (for example, how long it takes the CSS unit to repair a vehicle, or to order and issue a part to the customer unit). The statistic was hard, unavoidable, and briefed often to senior officers, while the value the soldiers received from training was somewhat intangible, and certainly took time away from conducting the measurable CSS missions.

As the US has committed itself worldwide fighting the Global War on Terrorism, CSS soldiers have found themselves playing much broader roles on the battlefield, with sometimes remarkable but occasionally tragic results. As America watched on television, US forces entered Iraq on March 20, 2003, and CSS soldiers followed closely behind the quickly moving lethal combat formations. Bypassed Iraqi forces in An Nasiriyah ambushed one such unit, the 507th Maintenance Company, on 23 March 2004. Of the 33 CSS soldiers who entered the town in 18 vehicles, 11 were killed and seven were captured. The book *On Point: The United States Army in Operation Iraqi Freedom* describes some of their ordeal:

Taking multiple hits from RPGs and small-arms fire, the tractor-trailer crewed by Specialist Jun Zhang and Sergeant Curtis Campbell came to a stop. Zhang leapt aboard the trailing tractor-trailer crewed by PFC Marcus Dubois and Corporal Damien Luten, who had just been shot in the leg....CW3 Mark Nash, carrying two wounded passengers, managed to get a bit farther south before Iraqi fire stopped his HMMWV...PFC Dubois, CPL Luten, and SPC Zhang turned their slow, awkward tractor-trailer around and returned to help CW3 Nash and his two wounded NCOs. Shortly after this, PFC Elliot arrived in his 5-ton fuel truck,

¹³ Naylor, “Chief of Staff to Soldiers: You’re a Rifleman First”.

carrying SPC Grubb, who was already wounded in both arms. SGT Matthew Rose, driving the last tractor-trailer, and his co-driver, CPL Francis Carista, also arrived at this point. Together, the soldiers formed a defensive perimeter, while Rose, a combat lifesaver, supervised three other combat lifesavers in treating the wounded.¹⁴

Until all the soldiers were accounted for, the American media focused heavily on those soldiers who went captured or missing from the ambush site, interviewing their family and friends, and providing biographical sketches. Many stories shared common themes of logistics soldiers who did not expect to encounter the enemy. For example, CNN.com led off a 13 April article on the captured soldiers this way: “SPC Shoshanna Johnson wanted to wield a whisk, not a rifle. When she enlisted in the Army in 1998, her mission was to become a chef, not a soldier.”¹⁵

The events at An Nasiriyah were not isolated. Army Vice Chief of Staff GEN Richard Cody told members of Congress on 17 September 2004 that “every day in Iraq, our Combat Service Support is getting engaged as much as our infantry patrols.”¹⁶ Recent experiences from Iraq have shown that resupply and convoy operations are daily business and must be treated like a combat operation. Also, CSS units are regularly being called upon to provide base security and to provide force protection for civilian contractors.¹⁷

CSS soldiers are also integrating into infantry units conducting raids, security patrols and vehicle checkpoints. Female CSS soldiers, members of “Team Lioness”, conduct body searches of Iraqi women, enabling US forces to hunt for insurgents while not violating Muslim culture that men are not to touch women they do not know. Prior to the formation of the team, some insurgents began hiding weapons and other materials under women’s clothing, knowing they

¹⁴ Gregory Fontenot, LTC Ed Degan, and LTC David Tohn, *On Point: The United States Army in Operation Iraqi Freedom*, (Fort Leavenworth, KS: Combat Studies Institute Press, 2004), 158.

¹⁵ “Ex-POW planned on cooking, not fighting”, CNN.com, April 13, 2003, available from <http://www.cnn.com/2003/US/04/13/sprj.irq.pow.johnson/index.html>. Accessed October 1, 2004.

¹⁶ SGT Reeba Critser, “Vice Chief Talks about Transformation”, *Fort Leavenworth (KS) Lamp*, September 23, 2004, 16.

¹⁷ “OIF Combined Arms Assessment Team Initial Impressions Report”, November 6-13, 2003, Center for Army Lessons Learned, Fort Leavenworth, KS, Observations 10002-21760, 10001-07046, and 10010-62572, available from <https://call2.army.mil/products.iir/OIFSOSIIR/appa.asp>. Accessed on September 3, 2004.

would not be found. In addition to capturing material, the female soldiers have made the Iraqi women more comfortable and have been able to collect needed intelligence from them. The CSS soldiers perform tactically, accompanying units on foot patrols in full combat gear and firing on insurgents when necessary.¹⁸

In addition to performing tactical missions, CSS soldiers are now called upon to carry out multiple logistics missions, often with new equipment, and sometimes with no formal training. For example, soldiers in a Field Service unit were issued a newly fielded laundry system in late September 2001, and deployed to Uzbekistan with the new equipment in October 2001. Besides providing normal field service support, when they deployed to Afghanistan in December 2001 they were called upon to provide water distribution for multinational, joint coalition troops. The soldiers in a field service unit are trained to provide shower, laundry and light textile support to troops in the field, but they are not specifically trained on water purification and distribution operations. With oversight provided by three water purification specialists, the field service soldiers quickly learned the intricacies of providing potable water to between 5,000 and 6,000 troops daily. These soldiers also had to be culturally aware and able to communicate across languages as they worked regularly with Afghan drivers (as well as soldiers from other nations in the coalition forces) to accomplish their mission.¹⁹

Recent Lessons Learned from Operation Iraqi Freedom identified further points where CSS soldiers have to diverge from their narrow, technical training. First, because CSS units have limited access to computing or network repair specialists, CSS soldiers have to teach themselves skills to keep supply networks running. Next, with scarce interpreters, soldiers have to figure out

¹⁸ Borden Lubold, "Band of Sisters: Army 'Lionesses' hit streets with Marines on combat ops", *Marine Corps Times*, August 9, 2004, available from <http://www.marincorpstimes.com/story.php?f=1-MARINEPAPER-280274.php>. Accessed on 1 October 2004.

¹⁹ CPT Jeremy Smith, "Establishing Water Operations at Bagram, Afghanistan December 2001 to April 2002", *Quartermaster Professional Bulletin*, Summer 2003, available from http://www.quartermaster.army.mil/oqmg/Professional_Bulletin/2003/Summer03/Establishing_Water_Operations.htm. Accessed on October 1, 2004.

how to communicate with and gather information from the local populace. Finally, the report notes, “junior leader (and soldier) interaction with the local neighborhood is truly the foundation for rebuilding the Iraq government”.²⁰ All soldiers, regardless of MOS, must have the awareness to act appropriately according to the local situation. The Center for Army Lessons Learned draws the following lessons: soldiers must be skilled, tough, and aggressive; able to interact sensitively with local populations; able to work outside their tactical roles; advanced marksmen; and small unit leaders must be innovative and decisive, prepared to work two levels up (i.e., a Sergeant should be able to perform like a Sergeant First Class).²¹

While soldiers entering the Army a few years ago may have trained to become a cook or a mechanic, today every soldier is expected to be a skilled, tough and aggressive warrior, able to collect and analyze intelligence, and trained to interact sensitively with local populations.²² When we list the qualities a CSS soldier must have to perform successfully today, we can come up with the following list:

- Able to work across the full spectrum of operations, from humanitarian assistance to major combat
- Tactically competent and able to protect himself against an unpredictable, not easily identifiable adversary
- Able to incorporate rapidly changing technology into his existing skill set
- Able to work on a variety of systems; not limited to one narrow technical specialty
- Culturally aware; able to interact positively with the local population

This list is identical to the list identified for the CSS soldier of the future. We cannot wait to grow the flexible, adaptable, technically and tactically competent CSS soldier; he must be on the battlefield today. For the Army to develop soldiers with these dissimilar characteristics of

²⁰ OIF Initial Impressions Report, Observations 10000-57171, 10001-61797, and 10002-02860

²¹ French, “CALL CA-US Staff Talks” Slide 11.

²² French, “CALL CA-US Staff Talks”, Slides 8 and 11.

competence and adaptability, it must employ the appropriate learning models, soundly based on current psychological research. The next chapter will identify learning factors that a successful training paradigm must consider.

CHAPTER 2

The Meaning Behind the Words

Before one attempts to discern methods for training soldiers to be competent, flexible and adaptable, he must first develop an understanding of the concepts. Princeton University's WordNet defines adaptability as "the ability to change or be changed to fit changed circumstances". Flexibility, a related word, is defined as "the quality of being adaptable"²³. Merriam-Webster characterizes the term competence as "having requisite ability or qualities; having the capacity to function in a particular way".²⁴ Adaptability and flexibility then, relate to being able to adjust and function in various environments, while competence relates to having abilities that do not diminish regardless of the situation. It appears the characteristics of adaptability and competence, while not necessarily opposed to each other, do not draw from the same source. One can be competent at a particular task without being adaptable, and one can be adaptable without being technically or tactically competent. This dichotomy suggests that different approaches be used in honing these characteristics in soldiers. To better understand how to approach the task of teaching soldiers to be both adaptable and competent, one must consider the major learning theories, including cognitive, behavioral, and practical variants and applications.

²³ See Princeton University Wordnet 2.0, "Adaptability", (Lexico Publishing Group, 2004), available from <http://dictionary.reference.com/search?q=adaptability>. Accessed on November 4, 2004; Wordnet 2.0 "Flexibility", available from <http://dictionary.reference.com/search?q=flexibility>. Accessed on November 4, 2004.

²⁴ Merriam-Webster Online Dictionary, "Competence", (Mirriam-Webster, 2004), available at <http://www.merriamwebster.com/cgi-bin/dictionary?book=Dictionary&va=competence>. Accessed September 26, 2004.

Cognitive Approaches

Constructivist Theory proposes that learning is an active process in which learners construct new ideas based on current and past knowledge. Jean Piaget, one of the major influencers of Constructivist theory, proposed that learning occurs through an interaction of the processes of accommodation and assimilation. In accommodation, one adjusts his schema (a particular model of understanding and thinking about the world) based on new experiences or information, while in assimilation, one interprets new experiences or information based on a preexisting schema. Learning results from a balanced tension between these two processes.²⁵ Piaget believed that intelligence is shaped by experience, and that a teenager's ability to reason abstractly and manipulate symbols arises from the active exploration of the immediate concrete environment that takes place in early childhood.²⁶ While Piaget's work focused on children, many believe his theories are applicable across the life span. Since Constructivists believe that learning is an active individual process that builds on existing experiences, the education system should shift from passive reception of data to a more individualistic experimental setting where the learner actively engages in constructing new knowledge through interaction with the surrounding environment.²⁷

Russian theorist Lev Vygotsky argued for a variant of Piaget's approach. Vygotsky believed that social interaction plays a fundamental role in learning. Social constructivists agree that education should not be passive, but argue that a more appropriate learning environment is one that encourages human dialogue, interaction, negotiation, and collaboration.²⁸ Cooperative learning, which emphasizes group scores for collaborative projects, is a practical example of the

²⁵ David Kolb, *Experiential Learning: Experience as the Source of learning and Development* (Upper Saddle River, NJ: Prentice Hall, 1984) 23

²⁶ *Ibid.*, 12

²⁷ Curtis Bonk and Robert Wisher, *Applying Collaborative and e-Learning Tools to Military Distance Learning: A Research Framework* (Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences, Sept 2000), 6.

²⁸ *Ibid.*, 7

social constructivist approach. Another example is the teaching of sensory-motor skills (such as sports or equipment operation) through imitation.

Both cognitive and social constructivists emphasize the learner's active involvement with external stimuli. However, some critics have cautioned that instituting curricula based on discovery or cooperative learning without providing appropriate structure, guidance and assessment will not necessarily have the desired effects. For example, some children following Piaget's model did not learn the principle of conservation by experimenting with water in different sized jars; they just learned how to pour water back and forth.²⁹ Likewise, research indicates that assigning group work with no individual incentives (such as individual grades along with group grades) may not be effective if members of the group do not have internal motivations to participate³⁰ (in fact, individual motivational factors are considered to have a profound influence on achievement, independent of a student's ability³¹). Finally, the cognitive approach holds that learning builds on previous information. Students with little experience in an area may have difficulty thinking abstractly about that subject.³² Thus, successful cognitive approaches to teaching require active involvement from instructors to assess the learner's level of knowledge and motivation, develop appropriate course content, provide feedback, and serve as learning guides.

Behavioral Approaches

While constructivists are concerned with how learners acquire cognition (perceptions, attitudes and beliefs), behaviorists emphasize the study of observable behavior. Behaviorists

²⁹ Kolb, *Experiential Learning*, 14

³⁰ Gary Berg, *The Knowledge Medium: Designing Effective Computer Based Learning Environments* (Hershey, PA: Information Science Publishing, 2003), 17.

³¹ Barbara B. Smith, "How Do Learners Learn", (research paper, Virginia Polytechnic Institute and State University, 1997), 7.

³² Gwen B. Fischer, "Developing Students' Adaptive Learning Skills", *College Teaching*, 47, no. 3 (1999): 97. A relevant example is trying to teach logistics support relationships among units when the learner has never been assigned to an operational unit.

approach learning as a relationship between stimuli and responses. B. F. Skinner, an influential proponent of behavioral psychology, focused on teaching as the arrangement of opportunities for reinforcement. The factors involved are the environment where learning takes place, the occasion when the behavior occurs, the behavior itself, and the consequences of the behavior.³³ Many think of behavioral psychology in terms of simple classical conditioning, recalling the ubiquitous example of Pavlov's dog experiments.³⁴ Skinner argued that most behavior is operant, where the environment is complex, and one cannot identify one clear stimulus (cause) that consistently elicits the intended response (effect).³⁵ However, if one can provide a reinforcement for the operant response, its probability of occurring again increases.³⁶ Reinforcement can be positive (providing a reward when the appropriate response occurs) or negative (removing an aversive stimulus with the appropriate response). Both positive and negative reinforcers can be conditioned; that is, a neutral stimulus that occurs repeatedly with a reinforcer will eventually take on the capacity to elicit a response even without the reinforcer.³⁷

Much of Skinner's work revolved around determining schedules of reinforcement. Skinner found that subjects learning a behavior respond initially to continuous reinforcement, where a reinforcer is given to every appropriate response. After a behavior is learned, intermittent reinforcement (where a reinforcer is given to some, but not all, appropriate responses) triggers a greater response than continuous reinforcement. Extinction of a response (where no reinforcer is given to any appropriate responses) occurs more quickly if the learner

³³ Ibid., 17

³⁴ Pavlov demonstrated that by ringing a bell every time a dog sees food and salivates because of the presence of food, the dog would eventually be conditioned to salivate when a bell is rung, even if the food does not appear.

³⁵ Winfred Hill, *Learning: a Survey of Psychological Interpretations*, 3d Ed. (New York: Harper & Row, 1977), 83.

³⁶ For example, although a mother may not know why her baby vocalizes the sounds 'ma ma', the joy and excitement she shows to her baby upon hearing those sounds will increase the probability that the baby will make the vocalizations again.

³⁷ However, because the learner operates in a complex environment, one cannot assume that a conditioned stimulus will always elicit the appropriate response. For example, a bird who has been taught to peck a red key by receiving a food reinforcer will not tend to peck the key if it is not hungry. Stimuli are only one set of variables that influence the emission of operant responses.

previously was on a continuous reinforcement schedule than if he was on an intermittent schedule.³⁸

Skinner's work applies directly to skills training. Through a technique known as shaping, instructors can train subjects to perform complex acts that may be outside their range of normal behavior. The behavior is shaped through a series of approximations, each made possible by reinforcing certain responses while ignoring others. The approach brings behavior gradually closer to the desired pattern. Through shaping techniques, Skinner was able to train pigeons to bowl and play ping pong.³⁹ Skinner was an early advocate of programmed instruction that allows immediate feedback (a reinforcer) to responses. Much early computer aided instruction was based on Skinnerian principles. The US military system of training based on tasks, conditions and standards, where individual performance behaviors are initially taught and then integrated into more complex situations, is a relevant example of behavioral training.⁴⁰

Behavioral approaches aid in training sensory-motor skills, such as playing sports or operating equipment. Learning models emphasize the role of sensory information in the acquisition of new motor skills as both a stimulus and a reinforcer (as a type of feedback).⁴¹ Researchers Rushall and Lippman. advocate that learning motor skills can best be initially taught by presenting limited amounts of information at a slow rate to ensure accuracy. Errors in complex motor behavior must be corrected early, because each movement provides a sensory feedback for the next movement. The brain stores whatever movement patterns have been repeated, whether or not they are correct. The brain does not immediately store a memory of how to perform a skill accurately, but within six hours of acquiring a new physical skill, the skill

³⁸ Hill, *Learning*, 80-94.

³⁹ *Ibid.*, 96-97.

⁴⁰ George Reed and others, "Mapping the Route of Leadership Education: Caution Ahead", *Parameters, US Army War College Quarterly*, 34, no. 3, (Autumn 2004), 46.

⁴¹ "Motor Learning" (Northeastern University Bouve College of Health Sciences, n. d.), available from www.ptd.neu.edu/mjamali/learning.htm. Accessed Nov 9, 2004.

becomes more automatic.⁴² After the formative stage of skill learning has taken place, rehearsals should add speed and complexity.⁴³ Long-term retention of procedural motor skills (such as rifle marksmanship) depends upon regular practice.⁴⁴

Critics argue that behavioral approaches view concepts to be learned as fixed and unchanging. If learning is viewed as a process of adaptation (where ideas can be formed and re-formed over and over again given an individual's level of experience), concepts taught behaviorally can be seen as "nonlearning", since a strongly acquired behavior is unlikely to change as a result of experience or circumstances.⁴⁵ Military approaches such as "competency mapping", where complex tasks are broken into simple steps, are criticized as over-engineered and too rigid for today's rapidly changing operational environment.⁴⁶ In addition, the process of shaping behaviors requires a great deal of instructor time and art. Instructors should tailor programs to the individual, and provide immediate feedback. If the trainer moves too quickly, early shaped behaviors will begin to extinguish, while if the pace is too slow, the training will take excessive amounts of time to complete.⁴⁷ Also, as was previously mentioned, learners may forge faulty relationships from stimuli. Once an error is assimilated into the knowledge base it is

⁴² Henry H. Holcumb and Reza Shadmehr, "Researchers find where brain stores physical skills memories", John Hopkins Medicine News Release, August 8, 1997, available from www.hopkinsmedicine.org/press/1997/AUGUST/970802.htm. Accessed November 5, 2004. This study from John Hopkins showed that the prefrontal cortex is used as subjects learn a physical skills, but after several hours, the skill is transferred to the cerebellum. In a related study, Harvard Medical School researchers found that skill acquisition improves significantly (about 20% better) if learners get a good night's sleep (indicated as between 6 and 9 hours) after initially learning the skill. See Harvard Medical Schools, "Practice Makes Perfect, If You Sleep on it", Harvard Medical Schools Consumer Health Information, July 2, 2002, available at www.intelihealth.com/IH/ih/WSIHWOOO/333/24644/351981.html. Accessed on November 5, 2004.

⁴³ B. S. Rushall and L. G. Lippman, "The role of imagery in physical performance", *International Journal for Sport Psychology* 29, (1997): 57-72.

⁴⁴ Greg Kearsley, "Learning Domains" *Theory into Practice*, 2004, available from <http://tip.psychology.org/sensory.html>. Accessed on November 5, 2004.

⁴⁵ Kolb, *Experiential Learning*, 26.

⁴⁶ Reed, "Mapping Leadership Education", writes, "the more we try to describe and prescribe a list of defined, specific competencies, the more we lead away from the agile, adaptive, self-aware [soldier] we want." 53.

⁴⁷ Hill, *Learning*, 97.

difficult to remove.⁴⁸ Also, the environment where the training occurs must closely match the environment where the response is expected, or the behavior may not transfer. Finally, many learners view as boring approaches that focus on content rather than the learner.⁴⁹ Thus, successful behavioral curriculum is used for teaching immutable concepts and skills, is carefully designed and implemented in a realistic environment, is monitored with immediate feedback to ensure appropriate stimuli and responses are encoded (but errors are not), and is calculated to minimize boredom, which affects motivation to learn.

Blended Approaches

Other theories do not view learning as an either/or process, but believe learners can benefit from both cognitive and behavioral methods as appropriate. Experiential learning sees learning as a life-long holistic process derived from personal meaning, and believes that knowledge adapts based on life experiences. The theory recognizes that individuals have relatively consistent learning styles across their lifetimes, and advocates that students learn best when they are immersed in an environment that matches their preferred style.⁵⁰ Those who tend to prefer abstract conceptualizations thrive in theory based classes, but see group exercises and sharing feelings with classmates as a hindrance to their learning. People who prefer concrete experiences are more comfortable in settings where skills are applied to real-life problems, and feel they gain little from theoretical reading assignments. However, when a particular learning style is strongly cultivated, a learner may become intolerant of other styles, and have trouble adapting to changing situations. For example, engineers require a strong ability to work with

⁴⁸ Smith, "How do Learners Learn", 9. A relevant example is the 'anticipation' response that some novice rifle shooters exhibit. When the weapon kicks upon firing, they change their breathing and grip. If not immediately identified and extinguished, some firers come to anticipate the weapon kick by changing their breathing and grip prior to pulling the trigger. This makes it unlikely that the marksman can hit the target.

⁴⁹ Millie Abell, *Deepening Distributed Learning: Motivating Soldiers to Learn, Grow, Achieve*, (Fort Monroe, VA: Headquarters, TRADOC, 2003), available from www.tadlp.monroe.army.mil/Millie%20A.%202003%20paper.htm. Accessed on November 2, 2004.

⁵⁰ Berg, *Knowledge Medium*, 21.

abstract conceptualizations. Their education and early career paths sharpen these skills, but does not actively develop the affective or behavior competencies required as these individuals transition into management positions. In a 1981 study, experiential psychologist David Kolb found that one third of participating technical managers felt unqualified in the competencies of dealing with people, setting goals, and making decisions. However, most felt they had gained these skills adequately through on the job learning, especially when the work environment supported individual growth and development.⁵¹ Studies in adult learning agree that workplace learning is most effective when it is informal and takes place in the real-work environment, and that motivation is a key component of learning. However, while some psychologists argue that adult learners are self-directed and internally motivated, others find that many adult learners do not respond well to self-directed learning courses.⁵² Thus, one cannot assume that it is possible to ignore issues of motivation and structure in adult learning.

Related to learning styles is the concept of multiple intelligences, proposed by Harvard Psychologist Howard Gardner. Expanding on the intuitive concept that everyone has different levels of aptitude in various areas, Gardner emphasizes that individuals possess a number of distinct forms of intelligence in varying degrees, and should be encouraged to develop their natural preferences.⁵³

Psychologists Mick Roach, Paul Blackmore and Jacqueline Dempster highlight two complementary forms of learning, which appear to acknowledge the need for both behavioral and cognitive approaches, depending on the type of learning taking place. *Adoptive learning* requires the application of well-understood knowledge and the mastery of tools, techniques and

⁵¹ Kolb, *Experiential Learning*, 183-202.

⁵² See literature reviews in Abell, *Deepening Distributed Learning*, and Berg, *Knowledge Medium*, 19-25.

⁵³ Kearsley, "Gardner", *Theory into Practice*, available from www.tip.psychology.org/gardner.html. Accessed on November 18, 2004. The identified intelligences are linguistic, musical, logical-mathematical, spatial, body-kinesthetic, intrapersonal (eg, insight), interpersonal (social skills), and naturalist.

procedures in bounded situations. This type of learning is associated with competence and is not easily transferable to other situations. Any learning situation that requires knowledge of specific content, established structures and principles might be categorized as adoptive. *Adaptive learning*, linked with expertise, requires the development and transfer of knowledge in open situations. One type is not superior to another. Descriptively, the two appear to match positively to previously discussed theories. Adaptive learning may be similar to the concepts advocated by constructivists, while adoptive learning may be achieved with behavioral methods. The researchers argue that the two types of learning are fundamentally different and have conflicting requirements. Although some adoptive coursework may be required (as a knowledge base) to complete adaptive tasks, they note that the requirement for form and structure can be counterproductive in encouraging the creative process. The more fixed form that is required, the less students will develop independent judgments and select supportive evidence. Roach et al propose that open assignments, with few explicit requirements, develops adaptive learning skills, while assignments that are familiar and pre-defined allow students to fall back on purely adoptive learning approaches.⁵⁴

Cognitive psychologist Gary Klein agrees with the concept that teaching form does not make a person an expert. His research on expert decision-making indicates that by training individuals in formal methods of analysis, one may actually slow down the development of time-pressured decision making skills. Klein asserts that experts rely on intuition to make decisions, and those experts develop intuition through experience of numerous difficult situations. He suggests training strategies to expand the experience base. These strategies include placing individuals in realistic scenarios and quickly assessing numerous situations, or reviewing and

⁵⁴ Roach, Mick, Paul Blackmore and Jacqueline Dempster, "Supporting High-Level Learning through Research-Based Methods: A Framework for Course Development", *Innovations in Education and Teaching International*, 38, no. 4 (Nov 2001), 371-376.

discussing compilations of difficult situations.⁵⁵ He identifies ways in which experts across fields learn: they articulate goals and identify areas for personal improvement (in other words, they are internally motivated and self-aware); after accumulating experiences, they receive accurate and timely feedback; and they review their experiences to derive new insights.⁵⁶

Guidelines for developing the CSS Soldier

Clearly, psychologists have varying views of how individuals acquire knowledge and skills. However, from this myriad of ideas, we can derive key points that will act as a structure for assessing how to develop adaptable, technically and tactically competent CSS soldiers. These learning guidelines include: providing varied learning environment based on the learning goal, using behavioral methods for skills mastery, incorporating active learner involvement for adaptive learning, ensuring an active instructor role, student motivation, socialization and metacognition, and providing an environment that promotes continual learning. Each guideline is discussed below.

Varied Learning Environment. The type of learning environment should vary depending on the objective. Generally, behavioral methods appear to apply well to skills training such as marksmanship and in teaching other unchanging concepts. More cognitive approaches seem to be appropriate in attempting to develop an individual who can adapt mentally.

Behavioral Methods for Skills Mastery. Skills learning is increased when concepts are broken into discrete, controlled events, time is given (six hours, preferably with sleep) for the body to synthesize the information, and then practiced at regular or high speed. Care must be taken in the learning situation that a student does not learn errors. Regular practice with intermittent reinforcement is essential for retaining skills.

⁵⁵ Klein, Gary, *Sources of Power: How People Make Decisions* (Cambridge, MA: MIT Press, 1998), 30-31, 42-43.

⁵⁶Klein, *Sources of Power*, 104-105. Smith's ("How Do Learners Learn") literature review also cites metacognition, or an awareness of what knowledge one possesses and what one lacks, along with a strategy to gain knowledge, as a key component of successful learning. See page 15.

Active Learner Involvement for Adaptive Learning. Adaptive learning requires learners to actively develop individual experiences. The experiences become the building blocks that allow additional learning and transformation. Learners gain experiences through active interaction with their environment. Learners do not transform knowledge through passive learning or through strict teaching of ‘correct versus incorrect’ answers.

Active Instructor role. Instructors must actively develop strategies for and assess performance of individual learners. Individuals may have different learning preferences, and will learn best with methods that approximate their individual style and aptitudes. Timely feedback is critical.

Motivation. Learner motivation greatly impacts the capacity to acquire knowledge and skills. Instructors cannot assume learners are internally motivated, and must develop strategies to maintain motivation.

Socialization. Learners interact with their environment while learning. Instructors should look at social dynamics to allow for motivation, imitation, and shared knowledge as a way for learners to gain experience. Settings should be informal and approximate the work environment.

Metacognition. Instructors should look for ways for students to develop awareness of their knowledge and strategies for achievement. This process must also be active; students must determine appropriate individual strategies and regularly review past experiences to derive new insights.

Learning as a continual process. Because the operational environment requires constant adaptation, and because learning is the process of adaptation, the culture should support continuous learning and not just as an activity relegated to the schoolhouse.

If applied, these concepts should aid in developing the flexible, adaptable, competent CSS soldier our nation requires. The next chapter will look at potential training programs and how they adhere to these guidelines.

CHAPTER 3

Having established a list of ideal concepts for developing adaptable and competent soldiers, this chapter investigates the first of two potential development programs for CSS soldiers and measures them against those concepts. The focus will be on individual programs (rather than unit training) for the junior soldier, the much discussed "strategic corporal" who must operate relatively independently, and whose individual actions can greatly impact the overall situation, not just at the tactical, but also the operational, and even the strategic level. The first program is the soldier development process currently in use by the US Army, and specifically the Quartermaster Center and School to train unit supply specialists (92Y).

CHAPTER 3

The 92Y: Current Model of an Adaptable CSS soldier

Unit Supply Specialists, or 92Ys, are located in limited numbers in almost every unit in the US Army. Typically, a company may have one unit supply sergeant (E-5 or E-6), and an additional supply specialist (E-1 through E-4). They are responsible for assisting the unit commander in all supply activities. They maintain accountability (through a manual or automated database of equipment, and by ensuring mandatory inventories are properly conducted), they order supplies through either military or civilian sources, and they monitor the unit budget. In addition, they are responsible for unit level maintenance on all small arms, as well as for operating the unit arms room. Unit supply specialists typically work relatively unsupervised and must be adept at a myriad of skills. They must have strong clerical skills (with and without computers) to keep up-to-date and accurate records. They must have mechanical proficiency to diagnose problems with and conduct weapons maintenance. They must be able to understand and interpret supply regulations for the commander. They must be able to act as a savvy purchasing agent to obtain supplies in a civilian economy (either in the US or overseas) when needed materials are not available through the military system. Finally, unit supply

specialists must ensure necessary supplies, such as food and ammunition, are delivered to soldiers in combat conditions. Because this may entail conducting convoy operations in hostile environments, unit supply specialists must be tactically proficient. In short, the unit supply specialist must be the model of an adaptive, technically and tactically competent CSS soldier.

Current Training Regulations

US Army Regulation 350-1, *Army Training and Education*, establishes the first goal of Army training and education as the development of a combat ready force, prepared to fight and win wars and conduct peacekeeping missions around the world. The manual divides training and education into three pillars: individual training and education (including Army schools and distance learning), operational assignments, and self-development. Specifically, the individual training system provides soldiers "the opportunity to gain the skills, knowledge, and experience needed to perform the duty position requirements of their operational assignment"⁵⁷. Proponent schools identify individual tasks and knowledge requirement, establish performance standards, and produce individual training products. This allows standardization across the Army. The regulation notes that individual training takes place through resident and nonresident schooling, and that personnel must also learn on their own time, through distance learning. It also indicates that while soldiers must be trained to standard to accomplish worldwide operational missions, training should be developed that is cost effective and takes advantage of emerging technology in simulations and distance learning.⁵⁸

The regulation also describes The Combined Arms Training Strategy (CATS), the Army's overarching strategy for current and future training that establishes training requirements and describes how the Army will train and sustain to standard. This program, developed by proponent schools with guidance from US Army Training and Doctrine Command, defines a

⁵⁷ *Army Regulation 350-1, Army Training and Education*, (Washington, DC: Headquarters, Department of the Army, April 9, 2003), 4.

⁵⁸ *Ibid.*, 2-4.

sequence of training events that serve as a map for training required skills and tasks, shows what skills will be trained in the institution or at the unit, and indicates how the skills will be trained. It ensures that training supports accomplishment of full-spectrum operations. Importantly, CATS links training events to the budget by quantifying and justifying resources required, which feeds into the budgeting process.⁵⁹ It also establishes the need for individual training products, guides training development, and controls what products are produced. Training products are not developed unless they are identified in the training strategy.⁶⁰

Basic Combat Training

Initial Entry Training (IET) begins the civilian's transformation into a soldier prepared to fight and win the nation's wars. The mission of enlisted IET, according to TRADOC Regulation 350-6, Enlisted Initial Entry Training Policies and Administration, is to "transform volunteers into technically and tactically competent soldiers that live by the Army Values, understand the importance of teamwork, and are prepared to contribute on day one in their first unit of assignment".⁶¹ The soldier is completely immersed in a controlled environment for nine weeks at Basic Combat Training (BCT), and for up to 11 more weeks at Advanced Individual Training (AIT), where he focuses on learning his military occupational specialty (MOS) skills, as well as reinforcing basic soldiering skills. IET strives to train in a realistic an environment as possible, with scenario-driven field training exercises acting as cap-stone events to a crawl-walk-run training process. All soldiers in BCT receive the same training, regardless of assigned MOS. The first three weeks (phase I) are devoted to development of individual basic combat skills; teamwork; physical fitness training; and immersion in the Army's core values. The next three

⁵⁹ *Ibid.*, 5.

⁶⁰ *TRADOC Regulation 350-70, Systems Approach to Training Management, Processes, and Products* (Fort Monroe, VA: Headquarters, Training and Doctrine Command, March 9, 1999), Chapter 4, available from <http://www.tradoc.army.mil/tpubs/regs/r350-70/index.html>. Accessed on November 12, 2004.

⁶¹ *TRADOC Regulation 350-6, Enlisted Initial Entry Training Policies and Administration*, (Fort Monroe, VA: Headquarters, US Army Training and Doctrine Command, August 15 2003), 6.

weeks (phase II) hone combat skills and emphasize weapon proficiency and qualification. The final three weeks of BCT (phase III) concentrates on individual tactical training, self-discipline, and teamwork, and culminates in a stressful tactical field training exercise.⁶²

Enlistees are led by drill sergeants who are “only the most professionally qualified soldiers”⁶³. They are selected by the Department of the Army. Their qualifications include that they are physically fit, show no emotional instability or speech impediment, have a high school degree or GED, a General Technical (GT)⁶⁴ score of 100 or higher (waiverable to 95), and receive a evaluation and recommendation from a lieutenant colonel or higher.⁶⁵ Drill Sergeants attend a nine-week qualification course. To graduate, drill sergeant selectees must successfully lead two physical training sessions; pass seven written examinations that cover leadership, counseling, drill and ceremony, and general military subjects; demonstrate correct drill, marching, and marksmanship procedures; and demonstrate ability to teach and test three basic military skills classes.⁶⁶ Drill sergeants conduct as much of recruit skill training as possible in BCT. They lead and serve as role models for between 17 and 20 enlistees each⁶⁷, coaching and mentoring them to achieve set standards through phased goal setting and performance counseling.

⁶² Ibid., Ch 2-3.

⁶³ *Army Regulation 614-200, Enlisted Assignments and Utilization Management*, (Washington, DC: Headquarters, Department of the Army, September 30, 2004), para 8-13.

⁶⁴ The General Technical (GT) Score is derived from Verbal Expression and Arithmetic Reasoning composite scores in the Armed Forces Vocational Aptitude Battery. The Battery is not considered an IQ test, but a measure of an individual’s aptitude to be trained in specific jobs. See Rod Powers, “ABC’s of the ASVAB”, *About.com*, (PRIMEDIA: 2004) available from http://usmilitary.about.com/cs/joiningup/a/asvababc_3.htm. Accessed November 30, 2004. In 2000, the average recruit’s GT score was 105. See Gen John Abrams, “Training and Doctrine Command Supports Army Transformation”, *Army Magazine*, October 2000, available from http://www.ausa.org/transformation/article_training.html. Accessed November 30, 2004. As a comparison, GT score requirements for a commissioned or warrant officer, or a Special Forces soldier are 110.

⁶⁵ *AR 614-200*, paragraph 8-13.

⁶⁶ Mancen NonCommissioned Officers Academy, “Annex C, Student Evaluation Plan”, *Manscen Noncommissioned Officers Academy Drill Sergeant School Student Guide*” (Fort Leonard Wood, MO: Headquarters, United States Army Maneuver Support Center, NonCommissioned Officers Academy and Drill Sergeant School, May 2004) available from <http://www.wood.army.mil/mncoa/dss/STUDENT%20GUIDE1.htm>. Accessed November 30 2004.

⁶⁷ *TRADOC Regulation 350-16, Drill Sergeant Program*, (Fort Monroe, VA: Headquarters, US Army Training and Doctrine Command, September 20, 2002), para 2-11.

They train and test individual skills using a “GO/NO” method of evaluating hands-on, performance oriented tasks. Drill sergeants are required to counsel each soldier at the end of each phase (about every three weeks), and if they fail to achieve a standard. Counseling establishes goals for future training and covers an objective evaluation of the soldier’s progress, adherence to values, and performance as a team member.⁶⁸ Drill sergeant duty is extremely demanding; assigned drill sergeants receive additional compensation and normally perform only one 24 to 36 month tour of duty during their career.⁶⁹

BCT is currently undergoing significant changes that incorporate more combat-related training as a way to better prepare all soldiers for deployments to Iraq and Afghanistan. The pilot program remains nine weeks long, but adds more than 30 individual tasks and nine new battle drills, as well as an additional ten days in the field. The training emphasizes convoy protection, checkpoint duty, hostage situations, and media-affairs training.⁷⁰ They train not just on their individual weapon, the M-16, but also on crew served weapons. Drill Sergeants are encouraged to be creative and provide current real-world problems in training. For example, basic radio communications training now includes enemy use of cell phones to detonate bombs, and physical conditioning runs may incorporate reaction to explosive ordnance. To fit the additional training in, the training week is extended from five to six and a half days a week, and enlistees average about five hours of sleep a night.⁷¹

⁶⁸ *TRADOC Reg 350-6*, chapters 2-3.

⁶⁹ *AR 614-200*, para 8-16.

⁷⁰ Reginald P. Rogers, “Changes in Army basic training biggest since World War II”, *TRADOC News Service*, Fort Monroe, VA, April 29, 2004, available from <http://www.tradoc.army.mil/pao/TNSarchives/April04/045404.htm>. Accessed November 30, 2004.

⁷¹ Fay Fiore, “Every Enlistee First a Warrior”, *Los Angeles Times*, November 29, 2004, available from <http://www.latimes.com/news/nationworld/iraq/la-na-basic29nov29,0,5567408.story>. Accessed November 30, 2004. Note that *TRADOC Regulation 350-6*, 15 August 2003, para 3-6, specifies that soldiers will have the opportunity for 7 hours of continuous sleep in garrison unless the soldier is scheduled for duty.

Advanced Individual Training

After graduating from BCT, Quartermaster soldiers attend AIT at Fort Lee, Virginia in preparation for their assignment to US Army units across the world. The 92Y Unit Supply Specialist course, the Advanced Individual Training for unit supply specialists, is a seven week, 3 day course that provides “apprenticeship training” in critical tasks dealing with requesting, receiving, issuing, and maintaining accountability of individual, organizational, and expendable/durable supplies and equipment. Soldiers are also trained on security and administration of a unit arms room, small arms maintenance procedures, and use of automated supply programs. Instruction is designed for group pacing, and instructor/student ratio established by the training support plan for most blocks of instruction is 1:15. Generally, the instructor presents the lesson through lecture or demonstration. All technical blocks of instruction include hands-on Practical Exercises and examinations.⁷² Lesson plans are detailed step-by-step templates that provide learning objectives, motivators, actions, conditions, standards, and checks on learning. They are approved by the Quartermaster Training Directorate and designed so training is standardized across instructors and over time. They include required presentation materials, situational information, and checklists for practical exercises. Although the lessons can appear quite rigid (for example, the training support package for maintaining a MK-19 weapon system includes a checklist of 12 GO/NO steps for disassembly, with an additional 35 GO/NO GO sub steps), the plans do attempt to be realistic by presenting scenarios soldiers are likely to encounter in their units.⁷³ The Program of Instruction also includes a 4-day

⁷² US Army Quartermaster Center and School, *Course Management Plan and Program of Instruction 92Y10 Unit Supply Specialist* (Fort Lee, VA: Headquarters, US Army Quartermaster Center and School, 1 October 1999).

⁷³ For example, see US Army Quartermaster Center and School, *Training Support Package, 92Y1211, Perform Organizational Maintenance on Machine Gun 40mm, MK 19 MOD 3* (Fort Lee, VA: Headquarters, US Army Quartermaster Center and School, October 1 1999).

Field Training Exercise designed to provide students with an opportunity to practice MOS and common military tasks in a realistic field environment.⁷⁴

Instructors in AIT are, according to regulation, subject matter experts who demonstrate the ability to be an instructor, have a high school diploma or GED, exhibit no questionable habits or character traits; are physically fit, and have at least one year experience in their MOS.⁷⁵ They are chosen locally for instructor duty, rather than selected at the Department of the Army level (although assignment to a training post such as Fort Lee strongly increases the likelihood that one would be chosen as an instructor, since a great deal of positions there are coded for instructors). They also must graduate from the Instructor Training Course, an 80-hour (two week) course that is designed to teach instructors how to prepare and present quality training using a behavioral approach.⁷⁶ Drill instructors are also incorporated at AIT; these NCOs assist with MOS skill process and may augment training as assistant instructors. Both Drill Sergeants and subject matter instructors provide reinforcement training on BCT common skills tasks throughout AIT; therefore all cadre must be certified on all hands-on tasks annually.⁷⁷

Like BCT, 92Y AIT is attempting to incorporate more combat related training in its instruction. The TRADOC Commanding General directed all AIT sites to integrate man-to-man combatives training; urban operations training; convoy live fire exercises, and weapons

⁷⁴ Quartermaster School, *92Y10 Program of Instruction*, 58.

⁷⁵ *AR 614-200*, para 6-9.

⁷⁶ US Army Training and Doctrine Command, *Total Army Instructor Training Course Program of Instruction* (Fort Monroe, VA: Headquarters, TRADOC, June 1, 1998), available from <http://atiam.train.army.mil/portal/atia/adlsc/view/public/297264-1/cmp/131-itc-1/cmp.htm>. Accessed December 3, 2004. The course emphasizes development of training plans using behavioral methods (preview the task, present in small increments, practice slowly, and perform at speed); the plans must clearly define measurable actions to be taught, and the environment they will be taught and performed in. It also instructs on basic communication skills, to include speech, posture, and instructor biases, and discusses use of praise and corrections as behavior reinforcers. See TRADOC, *TAITC Training Support Package Lesson 3: Develop a Training Outline* (Fort Monroe, VA: Headquarters, TRADOC, n. d), available from <http://atiam.train.army.mil/portal/atia/adlsc/view/public/298862-1/lp/131-itc-1-13/lsn3.html>. Accessed December 3, 2004.

⁷⁷ *TRADOC Regulation 350-6*, para 3-1 – 3-7.

qualification into its programs of instruction by 15 December 2004.⁷⁸ The Quartermaster Center and School has determined this will take eighty-six instructional hours, and is currently determining how to resource this requirement within available time and equipment constraints.⁷⁹

After 92Ys complete AIT, they do not receive additional institutional schooling until they are preparing for promotion to E-5, typically after about 4 years in service.⁸⁰ The Primary Leadership Development Course is a 4 week 2 day resident course offered at major installations across the world. All soldiers, regardless of military occupational specialty, attend the same course. The purpose of the course is to prepare junior soldiers for positions of higher responsibility as section leaders. Major subject areas include leadership (to include soldier counseling and team development), training, physical fitness training, land navigation, basic supply and maintenance procedures, and common field craft. Instruction takes place in small group settings, with usually a 1:8 or 1:16 instructor/student ratio. Methods of instruction include conference/discussion, practical exercises, and testing. The course culminates in a 30-hour tactical situational training exercise. The Program of Instruction, developed by the US Army Sergeants Major Academy for standardized use across the Army, appears at first to follow a rigid format, with detailed checklists and step-by-step instruction. However, instructors are given a great deal of flexibility in presenting information. For example, the training support plan on the Equal Opportunity Program (an initially intimidating 110 pages long for a three hour block of instruction) first includes rather dull information on Army policy and law, but then uses role-

⁷⁸ Robert E. Seger, Headquarters Training and Doctrine Command, "Update the Advanced Individual Training (AIT) Program of Instruction (POI) to incorporate the Warrior Tasks and Battle Drills", memorandum, S: 15 Dec 04, n. d.

⁷⁹ Ann Womack, Quartermaster Center and School Logistics Training Department, "FW: Looking for information on current and future training of 92A and 92Y", personal email, November 10, 2004.

⁸⁰ Quartermaster soldiers typically achieve the rank of specialist at 1.74 years in service, and sergeant at 4.36 years. See Office of the Quartermaster General, "Enlisted Proponent Brief" available at http://www.uassd.army.mil/POL/FY03_Sem/Enlisted.ppt. Accessed December 1, 2004. Although nonpromotable specialists can attend PLDC, they are third in priority for attendance. First priority is Sergeants who have not yet attended PLDC, and next are promotable specialists. See US Army Sergeants Major Academy, *Primary Leadership Development Course (PLDC) Program of Instruction* (Fort Bliss, TX: Headquarters, US Army Sergeants Major Academy, March 23, 2004), 2-2.

playing situations to illustrate concepts. The instructors can tailor the scenarios, and use their own experience in leading discussions with their soldiers.⁸¹ The program of instruction includes not only easily measurable tasks (such as conduct drill and ceremony), but also challenging open-ended problem solving situations, such as a Leaders Reaction Course.⁸²

Students are involved in seven to ten hours of instruction per day, including an hour of required study hall that allows students to prepare for future lessons. They are evaluated using written and performance evaluations. The three written evaluations cover leadership, training, and tactical skills, and have clear right/wrong questions. Students bring and may use references and notes for these examinations. Two performance evaluations test individual skills (Army Physical Fitness Test and Land Navigation), while the other five require that students lead their team in various situations. Students are evaluated leading a physical training session; conducting drill and ceremony; training their team on a common training task; and on overall leadership in garrison and in the field. GO/NO GO checklists for these evaluations range from the quantifiable (for example, “stated task, conditions and standards from the Training and Evaluation Outline”) to the ambiguous that require instructor judgment to evaluate (i.e., “Promoted and encouraged teamwork and achievement; fostered a healthy ethical climate”)⁸³. Instructors counsel students individually at least three times during the course: at the beginning to clarify goals and potential obstacles in the course; at the midpoint to provide performance feedback and relook goals; and at the end to provide final guidance. In addition, soldiers are provided feedback immediately after completing an evaluation.

⁸¹ US Army Sergeants Major Academy, *PLDC Training Support Program L227, Enforce the Equal Opportunity Program* (Fort Bliss, TX: Headquarters, U. S. Army Sergeants Major Academy, October 1, 2003)

⁸² See US Army Sergeants Major Academy, *PLDC Training Support Program W227, PLDC Situational Training Exercise* (Fort Bliss, TX: US Army Sergeants Major Academy, October 1, 2003). A typical scenario requires a team of soldiers to move boxes of supplies across a wide river given only six wooden planks.

⁸³ US Army Sergeants Major Academy, “Student Handout 1, Student Evaluation Plan”, *PLDC Active Component Course Management Plan Student Evaluation Plan* (Fort Bliss, TX: Headquarters, US Army Sergeants Major Academy, October 2003), SH 1-6 – SH 10-3.

Instructors for the Primary Leadership Development Course are graduates of not only the Instructor Training Course, but also the Small Group Instructor Training Course, a one-week course designed to teach instructors how to prepare and facilitate small group instruction. The course presents instructional methods used in small group instruction and uses adult and experiential learning theory to provide insights into how adult soldiers learn. It culminates with students presenting a lesson from approved courseware using small group instructional techniques⁸⁴. Although PLDC instructors are locally chosen rather than assigned by the Department of the Army, installation NCO Academies attempt to select the best-qualified soldiers for instructor positions. The Fort Benning NCO Academy provides this guidance:

Commandants must take a personal interest in the selection and assignment of SGLs/instructors. They must interview potential SGLs/instructors and select them based on their apparent leadership ability, communications skills, military bearing and appearance, physical fitness, attitude, and demonstrated motivation. SGLs/instructors are leadership mentors, role models, and teachers, and must lead by example. They must understand that their role as a mentor requires them to be there for the student, and this requires the highest level of dedication.⁸⁵

This indicates, that for PLDC, leaders are clearly aware of the importance of the instructor in developing future leaders.

Other Development Opportunities

DA PAM 600-25, *US Army Non Commissioned Officer Professional Development Guide*, provides goals for junior 92Y development. Besides AIT and PLDC, the manual notes that

⁸⁴TRADOC, *Small Group Instructor Training Course (SGITC) Course Management Plan* (Fort Monroe, VA: Headquarters, TRADOC, June 1998), available from <http://atiam.train.army.mil/portal/atia/adlsc/view/public/298868-1/tats/131-sgi-2/cmp.htm>. Accessed on December 3, 2004. The course emphasizes that instructors must be subject matter experts, facilitators, and observers; that learning is an active dynamic (not passive) process; that small group members share responsibility for learning; and that learning should take place in a nonthreatening but realistic climate that allows for experimentation, objective observation, and analysis of results. See TRADOC, *SGITC Training Support Program for Lesson Two, Roles, Responsibilities, Definitions* (Fort Monroe, VA: Headquarters, TRADOC, June 1998), available from <http://atiam.train.army.mil/portal/atia/adlsc/view/public/298870-1/lp/131-sgi-2-12/lsn02.htm>. Accessed December 3, 2004.

⁸⁵Henry Caro NonCommissioned Officer Academy, "Instructor Reply Form", Fort Benning, GA, available from <http://www.benning.army.mil/ncoa/instructorform.html>. Accessed on December 3, 2004

soldiers during the early years of their career should focus on building a strong base of technical expertise, MOS skills and common soldier tasks through operational assignment in MTOE units. While it recognizes that the operational tempo of tactical assignments limits opportunities for civilian education, the pamphlet encourages soldiers to take advantage of educational opportunities to obtain college credits through nontraditional means, including Army correspondence courses and the Service Member Opportunity College Associate Degree (SOCAD) Program.⁸⁶ In addition, Quartermaster Enlisted Proponency encourages soldiers to achieve 30 college credit hours by the time they attend PLDC and to complete requirements for an associate's degree by their tenth year of service.⁸⁷ SOCAD is a consortium of colleges that operate in cooperation with the Department of Defense to offer associate and bachelor's degree programs accessible to Army installations worldwide, and that accept transfer credits from member schools. The consortium has developed an Army Career Degree Program that offers degree options directly related to a soldier's military occupational specialty. Specifically, Coastline Community College offers an Associates in Arts with a Distribution Operations Management Emphasis for Unit Supply Specialists. The degree is occupational in nature, and not intended as the first two years of a bachelor's degree. All requirements for the degree can be fulfilled through distance learning or through transfer of credit through Army schools or senior MOS on the job experience, and up to two-thirds of credits can come from Army schools or experience. Courses required include Speech, English, natural and social sciences, and

⁸⁶ *Department of the Army Pamphlet 600-25, US Army Non Commissioned Officer Professional Development Guide* (Washington, DC: Headquarters, Department of the Army, October 15, 2002), para 31-12, 273.

⁸⁷ See Office of the Quartermaster General "US Army Quartermaster Corps Proponent Briefing for Department of the Army Command Sergeants Major/ Sergeant Major Promotion / Selection Board, Professional Development Model for 92Y Unit Supply Specialist" Powerpoint Presentation, Fort Lee, VA, June 2004, slide 63, available from http://www.quartermaster.army.mil/oqmg/enlisted_proponency/CSM-SGM%20Board%20Information%202004/CSM-SGM%20Board-2004%20Selection%20Criteria_files/frame.htm. Accessed December 4, 2004. See also Office of the Quartermaster General, "Enlisted Proponent Brief", Powerpoint Presentation, Fort Lee, VA, September, 2002, available from http://www.uassd.army.mil/POL/FY03_Sem/Enlisted.ppt. Accessed December 1, 2004.

humanities, as well as business-specific classes such as management and supervision, purchasing, and office automation.⁸⁸ The courses offered at Coastline Community College are generally delivered through CD or the Internet, allowing students to complete requirements on their own schedule. A quick review of a sample of the courses offered reveals they generally incorporate text, audio and video lessons, and require some writing assignments, but that much grading is weighted toward multiple-choice examinations.⁸⁹ The current course discussion forums are used to resolve technical problems or clarify course requirements rather than to discuss course content with the instructor or peers.⁹⁰

Strengths and Weaknesses of the Current Program

When compared to the guidelines for developing the CSS soldier, the following strengths and weaknesses are noted:

Varied Learning Environment - Strengths. The type of instructional environment in Army institutional education varies somewhat with the objective. Entry-level skills training generally uses behavioral techniques, while leadership training undertaken at PLDC, which attempts to develop mental flexibility, provides for cognitive instructional techniques in a small

⁸⁸ Coastline Community College, *SOCAD Army Career Degree Plan MOS 92 A and Y, Coastline Community College Associate in Arts – Distribution Operations Management Emphasis*, (Fountain Valley, CA: Coastline Community College, June 26, 2002), available from http://www.soc.aascu.org/pubfiles/degblidar/DegPln_92A_Y.pdf. Accessed December 3, 2004.

⁸⁹ For example Philosophy 120, Ethics, requires a 3-5 page personal position paper on an ethical dilemma, and its midterm examination consists of 3 essay questions. However, the final examination, which accounts for half of the course grade, consists of 100 multiple-choice questions. Likewise, requirements for Business 100, Introduction to the New Economy, consist of multiple-choice quizzes, written reviews of two business articles, and two multiple-choice examinations. The written reviews account for only 5% of the overall grade. See Ted Barnes, "Philosophy 120, Ethics, Course Overview" (Fountain Valley CA: Coastline Community College, 2004), available from <http://mil.ccc.cccd.edu/classes/phil120>. Accessed on December 3, 2004. See also C. Henry, "Business 100, Introduction to the New Economy, Syllabus" (Fountain Valley, CA: Coastline Community College, 2004), available from <http://mil.ccc.cccd.edu/classes/business100/>. Accessed December 3, 2004.

⁹⁰ See "Philosophy 120 Discussion Forum", Coastline Community college, available from <http://mil.ccc.cccd.edu/classes/phil120/discussionforum/>. See also "Business 100 Discussion Forum", Coastline Community College, available from <http://mil.ccc.cccd.edu/classes/business100/discussionforum/>. Accessed December 4, 2004.

group setting, such as role-playing and developmental counseling, to be overlaid over a strictly structured behavioral curriculum.

Varied Learning Environment - Weaknesses. Although behaviorally designed programs are appropriate for the initial learning of knowledge and skills at the entry level, one would expect a change toward adaptive learning strategies as soldiers away from skills acquisition and toward development of mental flexibility and adaptability. PLDC relies heavily on behavioral instruction, which does not support the course goal of graduating students who will make sound decisions, plan effectively, and lead their subordinates during national conflicts. In addition, unit supply specialists seeking self-development programs to become adaptive, flexible thinkers through higher civilian education should be cautious about the program encouraged by the Army through SOCORD. The curriculum offered in the 92Y SOCAD Army Career Degree tends to focus on the mastery of pre-defined knowledge (an adoptive, behavioral approach), rather than the development and transfer of knowledge in open situations (an adaptive, constructivist approach).

Behavioral Methods for Skills Mastery - Strengths. Skills training at BCT and AIT does emphasize dividing skills into discrete, controlled events, with practice occurring at gradually faster pace (through crawl-walk-run). In addition, the newly required reinforcement of common combat skills through BCT and AIT allows CSS soldiers to better retain these skills (although they must continue to be reinforced in unit-level training).

Behavioral Methods for Skills Mastery – Weaknesses. The addition of numerous training requirements without the addition of training time in the schedule may not allow the body time to properly synthesize the tasks and convert them to an automatic response. In addition, rushing through the initial learning of a skill may lead to the brain storing errors.

Active Learner Involvement for Mental Flexibility - Strengths. In the early stages of training in BCT and AIT, soldiers do not have many military-related individual experiences to draw from; they are typically entering an extremely foreign culture, and yet are expected to be

able to contribute on the first day of assignment to their unit. While teaching a strictly defined set of required skills, drill sergeants and instructors creatively attempt to provide realistic scenarios that will be translated into initial experience, which will become building blocks to allow additional learning and transformation. PLDC instructors, also operating within a behaviorally designed program, are trained and encouraged to actively engage and challenge their students in some ambiguous situations. The small group environment of PLDC also encourages active cooperative learning. The 92Y SOCAD Career Degree Program encourages active thought through some written assignments.

Active Learner Involvement for Mental Flexibility – Weaknesses. The Combined Arms Training Strategy and its emphasis on clear sequencing of quantifiable tasks as an overarching strategy for the Army, encourages easily measured and linked adoptive training approaches throughout a soldier's career; this is seen in the PLDC curriculum, which should more consistently emphasize adaptive learning techniques. The Distance Learning classes in the SOCAD Career Degree Program provided by Coastline Community College are conducted along adoptive lines that do not require an active transformation of knowledge. The majority of course credit in the program comes from a student displaying short-term retention of clearly defined facts.

Active Instructor Role - Strengths. Drill sergeants and instructors in BCT, AIT and PLCD are required to assess performance and provide feedback to their students on a regular basis through developmental counseling. The Small Group Instructor Training Course introduces PLDC instructors to active instructor concepts. Computer graded quizzes and examinations in the SOCAD distance-learning program provide immediate feedback.

Active Instructor Role – Weaknesses. The Army education model does not provide flexibility in allowing instructors to adjust teaching methods to specific learning styles. Because training developers centrally develop the training support packages, the instructors cannot

actively develop varying strategies for individual learners⁹¹. The Total Army Instructor Training Course does not adequately prepare instructors to actively engage with students. Instructor training in all Army schools falls woefully short of the educational requirements that even public preschool teachers must complete in the civilian world.⁹² Dialogue between instructors and students in the SOCAD distance learning course discussion forums appears to consist mostly of clear answers to technical and administrative questions.⁹³ This indicates that instructors may not take an active role in guiding students based on individual strengths and weaknesses.

Motivation - Strengths. Regular counseling in BCT, AIT and PLDC allows instructors to gauge student motivation. Use of current real-world scenarios in all Army schools (with the implied or verbalized assumption that if one does not meet the standard in training, he may die in combat) greatly increases motivation. The PLDC cooperative learning environment, with both individual and group assignments, provides positive peer pressure for students to be motivated to perform.

Motivation - Weaknesses. Suffering through extremely long step-by-step checklists, as is provided in the 92Y AIT Training Support Package, can prove to be very boring and cause students to lose motivation. It is difficult to measure motivation levels in the SOCAD Distance

⁹¹ In my two years experience as the senior instructor for Quartermaster Officer Basic and Advanced Courses from 2001-2003, I cannot recall any personal interaction with the CASCOM Training Directorate responsible for developing, evaluating and fielding all CSS training products. I was however, able to update course materials on a regular basis by submitting interim Program of Instruction changes for approval to the Deputy Commandant of the Quartermaster Center and School. These interim changes, while absolutely necessary to maintain relevant officer training courses in the quickly changing post 9/11 operating environment of the US Army, did not go through the CATS analysis that links training to resources; all changes in training remained unfunded.

⁹² According to the US Department of Labor Occupational Outlook Handbook, most states require their preschool teachers to hold an associates or bachelor's degree in early childhood education, or hold a national certification. See US Department of Labor, Bureau of Labor Statistics, "Teachers – Preschool, Kindergarten, Elementary, Middle and Secondary", *Occupational Outlook Handbook*" (Washington, DC: US Bureau of Labor Statistics, 2004), available from <http://stats.bls.gov/oco/ocos069.htm#training>. Accessed December 4, 2004. The most common national certification requires 120 hours of formal education and training in child development and instruction, as well as 480 hours of direct experience. See Council for Professional Recognition, "Child Development Associate Credential", (Washington, DC: Council for Professional Recognition, 2004), available at <http://www.cdacouncil.org/>. Accessed December 4, 2004.

⁹³ Dialogue may be conducted effectively through email and on instructor review of papers; I was unable to review samples of these methods of communication.

Learning courses, due to the limited interaction between instructors, students, and peers.

Restricted human contact in these courses may not motivate students to perform.

Socialization - Strengths. Training in squads with subject matter experts as instructors at BCT, AIT and PLDC provides the social dynamics to allow for motivation, imitation, and shared knowledge. These settings attempt to approximate the work environment.

Socialization – Weaknesses. Training in Army schools often is formal and stressful rather than informal and relaxed. In some instances this is by necessity, as initial learning of skills requires a controlled environment; also, as by its nature military operations are stressful and require obedience to a hierarchy, some stress and formality is required to replicate the working environment. However, the stress should be incurred during the proficiency practicing of a skill, rather than in initial learning. Likewise, replication of the work environment should be balanced with some informality to encourage adaptive thinking during leader development. The limited interaction observed in the SOCAD 92Y Distance Learning Program does not provide for shared motivation and knowledge.

Metacognition - Strengths. All Army courses identify terminal and enabling learning objectives that provide a map of the knowledge or skill to be achieved. Instructor training courses emphasize that instructors should display these objectives at the beginning and end of each block of instruction. The developmental counseling that takes place at Army schools allows instructors and students to jointly develop appropriate individual strategies for learning. The use of the After Action Review (AAR) after major training events, engrained deeply in Army doctrine and culture, allows individuals to review recent experiences to derive new insights.

Metacognition - Weaknesses. Simply showing a slide and reading a learning objective to a group of students (as often occurs in Army schools) does not always develop an active awareness of individual knowledge. The syllabi reviewed in the SOCAD 92Y Distance Learning Program do not identify course learning objectives.

Continual Learning - Strengths. Army training and professional development regulations emphasize the importance of continual learning by stressing self-development as a means to promotion. Unit-level training (not reviewed in the paper) and institutional schooling tied to promotions provide regular opportunities for individual growth throughout one's career.

Continual Learning - Weaknesses. The Army culture treats education gained through self-development as a necessary block to be checked for promotion rather than as a process that grows flexible, adaptable junior leaders. A soldier with no college education who attempts to follow the model set forth in Department of the Army Pamphlet 600-25, *NCO Professional Development Guide*, would have to take three courses each year while stationed in a tactical unit. The Army's high operating tempo and frequent deployments leave little personal time available for traditional college courses and may decrease motivation to attempt any sort of course that requires anything more than surface learning. The SOCAD distance learning program developed for 92Ys, as reviewed above, does not appear to be geared towards developing adaptive thinking.

In general, the current training paradigm provides a strong behavioral training model that is appropriate for initial skills training, but does not consistently adapt the model to more cognitive approaches when the goal of training changes towards developing flexible, adaptive thinkers. The current model does not require (or even address and encourage) that self-development be taught through primarily adaptive methods. The next chapter will look at a potential solution to these issues in a proposed training paradigm developed by the Army Research Institute.

CHAPTER 4

The Multi-Skilled Soldier Concept: a Potential Model

The US Army Research Institute for the Behavioral and Social Sciences released a study in April 2002 that attempted to provide a model for developing the Multi-Skilled Soldier, one who is "exceptionally adaptable and can adequately perform a greater variety of tasks on the

battlefield”.⁹⁴ They present a concept of training that would emphasize a competency-based approach, (rather than a task-based approach) with the intent of producing a thinking soldier, who is trained generically on items of equipment, and taught how to apply skills fundamentals across various systems and in diverse situations. In the model, the soldier is also taught in initial training on additional skills that normally fall outside his MOS, to provide increased skill-depth and redundancy across the force. The multi-skilled soldier would then be expected to sustain and deepen skills and knowledge through both unit training and self-development. Hamilton and Akman developed their paradigm so that initial entry training time is not lengthened, and field commanders do not incur an increased burden for individual training.⁹⁵

The first element in the potential training concept is termed Warrior Training, which replaces BCT. Its intent would be to provide all soldiers, regardless of MOS, with a common base of infantry and other common-skill training. The program would instill the value that every soldier is a war fighter first.⁹⁶ The concept appears akin to the current BCT with recent changes designed to increase combat skills and instill the Warrior Ethos mindset into all.

Advanced Training (AVT) would replace AIT. Like AIT, the training would focus on developing the soldier’s base MOS skills; however, the training would be designed to promote learning in a professional educational atmosphere. Although the program would not be as rigid as the current AIT, which continues the soldierization process through strict control and the presence of Drill Instructors, it would include tough, purposeful field training to impart the necessary skills. Soldiers would be trained generically on representative equipment, and learn how to adapt to what specific equipment their assigned unit might have. Soldiers would also receive modular Additional Skills Training (AST) in one or more subsets of skills associated with another MOS

⁹⁴ John Nelson and Akman, *The MultiSkilled Soldier Concept: Considerations for Army Implementation* (Alexandria, VA: US Army Research Institute for the Behavioral and Social Sciences, April 2002), 9.

⁹⁵ Ibid., 10-11.

⁹⁶ Ibid., 12.

(for example, a unit supply specialist may also receive fuel handler training). At the end of AVT and AST, the soldier would receive Unit-Specific Training (UST), which would be geared toward the equipment and missions of the actual impending unit of assignment.⁹⁷

Following initial training, soldiers would continue to develop skills and knowledge in their unit through unit training and self-development. Distance learning (with courseware approved by TRADOC) would play a crucial role in self-development. To motivate soldiers to participate in self-development, the Army would reward with promotions those who progress their education through this approach; soldiers who fail to progress would be significantly penalized.

The multi-skilled soldier training paradigm could be achieved through the Army's current training strategy, using CATS and the Systems Approach to Training (SATS).⁹⁸ It would, however, require additional human resources to develop and implement, particularly training developers. In addition, the training cadre would have to be prepared to employ educational methods that differ significantly from today's BCT and AIT.⁹⁹ The concept paper does not detail how instructor training would differ from what is currently offered.

Strengths and Weaknesses of the Potential Program

A comparison of the outlined Multiskilled Soldier Training Program with the established guidelines for developing the adaptable, competent CSS soldier identifies the following strengths and weaknesses:

Varied Learning Environment - Strengths. The type of instructional environment in proposed programs clearly varies with the objective. Skills training in Warrior Training appears

⁹⁷ Ibid, 12-14.

⁹⁸ SATS is the actual training development process that builds upon CATS principles to make training and education decisions. See *TRADOC Regulation 350-70*, Para. ES-1, and Army Regulation 350-1, Para. 1-10, 6.

⁹⁹ Nelson, *Multi-Skilled Soldier Concept*, 33.

to remain behavioral, while Advanced Training appears to include more cognitive approaches that teach principles which can be applied in different situations.

Varied Learning Environment - Weaknesses. It is unclear exactly what instructional methods will be used in Advanced Training. Also, while approach for self-development training relies heavily on distance-learning, the proposal does not advocate significant changes to current distance learning, which tends to use adoptive methods that do not correspond to the goal of adaptive learning.

Behavioral Methods for Skills Mastery - Strengths. Warrior Training skills development is accomplished through previously discussed behavioral methods, with an emphasis on reinforcement of newly acquired combat skills.

Behavioral Methods for Skills Mastery - Weaknesses. The additional training requirements achieved in Warrior Training with no additional allotted training time may not allow for proper synthesization of tasks into automatic responses, and may additionally lead to improperly learning errors that will be difficult to extinguish. Also, the professional educational environment advocated in Advanced Training (with no additional soldierization process) does not appear to provide for regular reinforcement of common military skills.

Active Learner Involvement for Adaptive Learning - Strengths. Emphasizing combat skills in realistic settings during Warrior Training provides a strong initial personal experience, which can become the foundation to allow for future transformation. Advocated changes in Advanced Training, especially the training on generic equipment, which is then adapted to specific devices, provides soldiers with a model they must actively manipulate depending on the situation, a very adaptive process.

Active Learner Involvement for Adaptive Learning - Weaknesses. The program retains the CATS/SATS strategies, a model that promotes clearly quantifiable, sequenced training tasks, which can lead to adoptive, behavioral approaches when the educational objective should be adaptive. Again, the program strongly emphasizes self-development through distance learning,

but does not detail that any changes should be made to a curriculum that currently promotes adoptive learning.

Active Instructor Role - Strengths. The potential program recognizes that current Army instructors are not properly trained to implement the methods advocated. In addition, the program acknowledges that training developers must have close relationships with instructors and course leaders if approved training support packages are to remain current, relevant, and adaptable.

Active Instructor Role - Weaknesses. The program does not detail how instructor selection or training should change to accomplish the new training goals. The program also does not specify any changes to present distance-learning approaches, which currently do not demonstrate active instructor involvement as learning guides to individual students.

Motivation - Strengths. The Multi-Skilled Soldier concept retains the use of instructors to gauge student motivation, as well of the use of real-world scenarios to motivate students. The use of rewards or penalties for participating in or failing to be involved in self-development provides an unambiguous motivation to continue individual education.

Motivation - Weaknesses. No changes are detailed to distance learning. In the current program, restricted human interaction may not motivate students to perform.

Socialization - Strengths. The program retains training in small-groups in Army schools, which provide social dynamics that allow for increased motivation, imitation, and shared learning. In addition, the program relaxes some of the formality and rigidity currently found in AIT, which may lead to increased adaptive thinking.

Socialization - Weaknesses. As has been noted, no changes are indicated for distance learning, which does not provide a social environment where learners may share learning.

Metacognition – Weakness.. The new program did not address this important aspect of learning.

Continual Learning - Strengths. The potential program greatly expands the concept of continual learning, providing strong motivation for soldiers to continue self-development throughout their careers.

Continual Learning - Weaknesses. The new program, by using rewards or penalties to promote continual learning, encourages the current culture which treats education as a block to be checked (“I did my distance learning course – now give me my promotion”). While the program recognizes that significant long term deployments and high operating tempo may not allow time for individual self development, it does not address how to overcome this hurdle.

In general, the proposed training model, the Multi Skilled Soldier concept, retains from the current program some behavioral training for skills development, but provides a different model for the training of Advanced Training skills that may produce more adaptive thinkers. However, the proposed model removes the opportunity to reinforce newly learned skills, creating the possibility that those skills could be easily extinguished. The new model does not address the need to change the emphasis in self-development toward adaptive learning methods. The final chapter will contrast the current and proposed learning models, and make recommendations for changes to Army capabilities in order to achieve an environment that will better ensure the growth of competent, adaptable CSS soldiers..

CHAPTER 5

Recommendations

An attempt to create an effective training environment for competent yet adaptable CSS soldiers requires the detailed comparison of the current and potential approaches against each other and current learning theory. This comparison will yield recommendations for improving training effectiveness. A chart developed for this paper that depicts the comparisons is found at Appendix A.

Common Strengths

Both the current program and the Multiskilled Soldier Concept adhere to current learning theory by taking a behavioral approach towards skills mastery. They each divide skills into discrete events in a controlled atmosphere, adding realism and speed as enlistees gain proficiency, and providing regular opportunities for reinforcement. They also emphasize active learning by providing an initial experience base through realistic scenario-driven training. Enlistees can gain motivation in both models through the use of real-world scenarios. In addition, the socialization gained through squad-level training that approximates the work environment may also provide motivation. Both programs emphasize that continual learning is important and provide regular opportunities for learning through attendance at institutional schools and unit training throughout one's career. These strengths should be retained in any learning model that attempts to develop junior soldiers be adaptable, while attaining technically and tactical proficiency.

Strengths of the Current Program

There are a few areas in which the current program matches learning guidelines more closely than the model identified in the Multiskilled Soldier Concept. Specifically, skills are regularly reinforced through behavioral methods in AIT, while the potential AVT does not appear to provide opportunities for reinforcement. In addition, the current learning model provides for an active instructor role through regular developmental counseling, a subordinate-centered communication process that results in instructor and student collaborating to develop a plan for students to achieve their goals.¹⁰⁰ The MSS model does not address the use of developmental counseling, or provide any other specific recommendations for an active instructor role. Finally, the current program's use of developmental counseling, AARs, and clear identification of learning objectives provides valuable opportunities for students to gain metacognition and take

¹⁰⁰ *Army Field Manual 22-100, Army Leadership* (Washington, DC: Headquarters, Department of the Army, August 31, 1999), Para. C-4 – C-5.

charge of their own learning. Again, the MSS concept does not clearly advocate the use of these (or any other) methods for achieving metacognition. Any training model for the adaptive, competent CSS soldier should retain the current program applications in these areas.

Strengths of the MultiSkilled Soldier Program

The MSS program does promote some concepts that more closely approximate those advocated by learning theory than does the current model. Specifically, the MSS construct clearly varies the learning environment depending on the desired attribute to be developed; it emphasizes behavioral methods for skills training in WT, and provides for cognitive approaches to teach principles that can be applied across equipment in a more relaxed AVT environment. The present model tends to rely on formalized behavioral training approaches for all junior level training that may be extremely boring and cause unnecessary stress, which could hinder adaptive learning. The MSS concept recognizes that current instructor training is not sufficient, and supports additional instructor training to prepare them to teach adaptive skills. It also advocates that training developers and instructors should work closely to adapt training as required, rather than remaining centralized as in the current program. Finally, the future program greatly expands the concept of continual learning as necessary for soldiers to survive in a quickly changing world. Training programs to develop proficient, adaptive CSS soldiers should embrace these concepts from the MSS model.

Recommendations for Change

Both the current program and the MSS concept incorporate some approaches that do not model current learning theory strategies, and may thus hinder the development of the flexible, competent CSS soldier. Three specific areas include: addition of training requirements without providing for additional training time; behavioral training emphasis throughout all training and education; and an emphasis on distance learning for self-development without articulating the

goals for self-development or evaluating distance learning as a means to attain those goals. Each area will be addressed below.

Both current and potential training paradigms add additional training requirements without allotting additional training time to accomplish them. Research in the area of motor-skills learning clearly identifies that the body requires time and rest to correctly synthesize tasks and transfer them to automatic responses. Soldiers must be given sufficient time to initially learn skills without increasing error. The addition of training tasks in the current BCT within the normal training period has narrowed soldier sleep to five hours a night. If this training pace is sustained, soldiers may begin to incorporate additional errors into their learned skills, and these errors may be difficult to extinguish. Enlistees should be closely monitored to identify if this is starting to occur. If so, initial training time should be lengthened if the current schedule cannot be adjusted to provide an appropriate training pace and sufficient rest.

The current and potential programs both retain an overarching behavioral training emphasis throughout all training environments, regardless of the training goal. The Army's Combined Arms Training Strategy, which is currently used and retained in the MSS concept, mandates a behavioral approach to training, regardless of the skill to be developed, where measurable individual performance is linked to and supports accomplishment of critical collective tasks, which link to and support mission accomplishment. Noted experiential and cognitive psychologists argue strongly against using behavioral techniques to teach adaptive skills.¹⁰¹ Learning theory supports Reed's argument that approaching all learning as a series of prescribed GO/NO GO skills, extensively detailed and nested in databases and matrices, may not be conducive for producing agile, adaptive soldiers. This approach suggests that all skills are unchanging and can therefore be mastered, which is precisely what the concept of life-long

¹⁰¹ See Klein, *Sources of Power*, Kolb, *Experiential Learning*, and Roach, "Supporting High Level Learning".

learning seeks to avoid.¹⁰² The training strategy should be modified to allow for some open-ended learning opportunities, with few explicit requirements, to develop soldiers' judgment and creative skills.

Both programs emphasize distance learning as the primary means for self-development but do not clearly articulate the purpose of self-development or provide oversight to assure distance learning programs achieve that purpose. DA PAM 600-25, *NonCommissioned Officer Professional Development Guide*, does not express exactly what soldiers should expect to achieve through self-development, except that they should focus on “maximizing leader strengths, minimizing weaknesses, and achieving individual leader goals” through a planned, progressive and sequential program that is comprised of individual study, education, research, and professional reading.¹⁰³ While the pamphlet’s emphasis on “leader” skills indicates an expectation that this avenue should be used to develop critical, higher level thinking skills, the checklist-style approach used throughout focuses on goals of completing courses rather than improving thinking skills. Attempting to follow the self-development timeline depicted in the pamphlet and fit coursework into an extremely demanding lifestyle with back-to-back deployments may further encourage soldiers to seek the easiest courses that achieve only temporary surface learning. The MSS concept appears to treat self-development similarly, although it does specifically identify the purpose of individual study as a means of increasing and sustaining the skills developed in institutional training¹⁰⁴.

Although the program is not required, and may not be typical of available distance-learning products endorsed by the US Army, the Unit Supply Specialists distance-learning coursework offered by Coastline Community College applies few learning concepts that should aid in developing an adaptive soldier. The coursework appears to rely more on adoptive

¹⁰² Reed, “Mapping Leadership Education”, 51-53.

¹⁰³ DA PAM 600-25, 3.

¹⁰⁴ Nelson, *Multiskilled Soldier Concept*, 14.

(requiring the memorization of knowledge) rather than adaptive teaching methods, which require the development and transfer of knowledge in open situations. The reviewed coursework does not articulate learning objectives, which may aid a student developing self-awareness and appropriate goals and strategies. Neither the instructors nor other students appear to have active dialogues pertaining to course material that should provide guidance, shared experiences, and motivation to achieve more than temporary surface learning.

The problems identified in the Coastline Community College distance learning coursework are unlikely to be isolated in just this particular distance-learning course. Berg, in his literature review, notes that while technology-enabled learning (such as distance-learning) can fit well with constructivist, learning-centered theories of learning, it often is used to automate unsuccessful teaching strategies.¹⁰⁵ He identifies the amount and quality of interactions with faculty members as key to the achievement of critical thinking in distance-learning environments¹⁰⁶, and relates that group learning in online communities strongly increases student motivation and achievement.¹⁰⁷ Abell reviews considerable research which indicates that distance learners perform significantly better when the course design features high interactivity and is specifically modified to address distance learning barriers.¹⁰⁸ Roach assesses that peer interaction (through the publishing and critiquing of peer work) is a large factor in successfully teaching adaptive thought through technological means, but argues that technology is more appropriately used for adoptive learning.¹⁰⁹ For adoptive learning, technology-based

¹⁰⁵ Berg, *Knowledge Medium*, 26.

¹⁰⁶ *Ibid.*, 101.

¹⁰⁷ *Ibid.*, 195.

¹⁰⁸ Millie Abell, *Soldiers as Distance Learners: What Army Trainers Need to Know* (Fort Monroe, VA: Headquarters, TRADOC, Futures Training Division, 2000), available from <http://www.tadlp.monroe.army.mil/abell%20paper.htm>. Accessed on November 2, 2004. This paper identifies barriers in distance learning as limited feedback; students becoming passive; students losing track of where they are in instruction (or not having metacognition); and programs relying on written rather than visual presentations.

¹⁰⁹ Roach, "Supporting High Level Learning", 379.

environments should be used as a tool that “enriches teaching rather than substitutes for it”.¹¹⁰ To continue to grow the adaptable, competent soldier through self-development, the Army should clearly identify learning goals, provide reasonable timelines for obtaining those goals given extremely high operational demands, and monitor self-development programs to ensure they are likely to aid a soldier in achieving those goals, rather than merely check a block.

Implications

Adjusting junior soldier institutional and self-development training to attain a learning environment that is consistent with current learning theory will require a significant shift in Army functions, particularly in the areas of leadership, training and personnel. Army leadership harnesses the potential for change and establishes cultural expectations for learning. The training community must adjust to meet the new expectations of leadership, and those training adjustments may create strong ripples through personnel policies.

The current Army leadership under Army Chief of Staff, General Schoomaker has made a shift and provided momentum to change by specifically addressing that all soldiers should be flexible and adaptable, technically and tactically competent. To achieve these expectations, a culture shift will also be required, that focuses on learning as a continual lifelong process that creates and grows adaptive individuals, rather than a GO/NO GO task that one must suffer through at regular intervals to gain promotion. While the recent incorporation into FM 22-100, *Army Leadership*, of developmental counseling methods is a step in the right direction, leaders at all levels must embrace all forms of learning as not merely a means to achieve individual goals, but as an essential requirement for mission success in the contemporary operating environment. Soldiers may gain more from active unit-level reading programs and discussion groups than from spending a weekend memorizing items for a distance-learning test.

¹¹⁰ Ibid., 378.

Training policy and development will also require considerable adjustment to accommodate and encourage active constructivist or cognitive learning approaches aimed at developing flexible, adaptive thinking in junior soldiers. Specifically, the Army's overarching training policy, embedded in CATS and its related systematic approach to training development, SATs, with its linked sequence of training events tied to specific performance measures, may not easily mesh with the less quantifiable goals of constructivist learning methods. The *SAT White Paper 3.0* argues that the SAT process can be used to facilitate multiple theories of learning. However, it goes on to list knowledge, experience base of the soldier, the motivation to learn in a self-directed environment, qualifications of training developers to design successful courses, and instructor ability as potential constraints to implementing training with constructivist measures.¹¹¹ The paper emphasizes the difficulties of developing training within SATs for unclearly defined processes not specifically linked to jobs.¹¹² It calls for a new training framework, the Performance Model, that shifts from focusing on a "trained soldier" to an effective soldier; uses assessments and performance feedback for improving rather than blaming; and ensures participation in the entire training development process by all stakeholders in the training, rather than by merely a centralized group of training developers who are divorced from the end product of training.¹¹³

The *SAT White Paper 3.0* regularly highlights that training developers lack the qualifications to use the SAT process to develop proper training, and that instructors must be trained differently to facilitate adaptive, critical thinking. Instructor and training developer coursework should be redesigned, incorporating constructivist and experiential concepts, to allow for effective development and implementation of adaptive thinking.

¹¹¹Communication Technologies, *SAT White Paper 3.0* (Norfolk, VA: Communication Technologies, Inc., August 24, 2000), 31.

¹¹² *Ibid.*, 35.

¹¹³ *Ibid.*, 60-61.

Training policy should also be adjusted to better articulate the goals for self-development, and to provide for assessments to determine what training methods can effectively assist learners in achieving those goals. Although Distance Learning may be convenient and relatively inexpensive, it is worthless if it fails to adequately develop targeted skills. Effective learning of adaptive thinking skills through distance learning requires active participation and regular interaction among instructors and students; these requirements weaken the apparent advantages of distance learning by reducing convenience and increasing costs.

Lastly, changing training policy and development to accommodate effective adaptive learning approaches will require a shift in personnel policy. Instructor qualifications should be relooked to ensure the selection process identifies those who are capable of providing expert, active facilitation. The Army should also consider developing a career path for the strongest instructors, which alternates operational assignments with instructor assignments. Expanding training timelines for both junior soldiers and instructors, must be carefully considered to ensure training is effective. As a valuable alternative to pushing overworked, overdeployed soldiers to seek dubious self-development through distance learning in their few hours of off-time, the Army should consider greatly increasing reenlistment incentives that allow soldiers to attend college as their place of duty for a term. These recommendations will impact the number of soldiers available for operational assignments, and may require either a reduction in optempo, or an increase in the Army endstrength, to accomplish critical missions while effectively growing competent, adaptable soldiers.

Recommendations for Future Study

The concept of developing flexible and adaptive yet tactically and technically competent CSS soldiers is extremely challenging. As each desired characteristic does not draw from the same source, the Army cannot expect to use a single method to develop these contrasting attributes. Studies of other leader training in other military services such as the Marines and the

Navy, or even of foreign militaries during earlier times, may aid in the search for appropriate models for a new Army training paradigm. Specifically, the Marine Corps is incorporating the training of recognition decisionmaking (a process where soldiers make quick decisions based on experience and intuition, rather than through laborious analytical methods) at all levels.¹¹⁴ The Navy junior officer training program has recently changed to emphasize the importance of active experience in the learning progress. Surface Warfare officers now receive a majority of their initial training aboard ship through interactive distance-learning courseware coupled with hands-on experiences, rather than through traditional classroom methods. Lastly, the German World War II experience of training logistics soldiers who were actively fighting on the Eastern Front may provide additional insight as to how to quickly adapt programs for immediate wartime requirements.

Psychological research into human learning continually produces new findings that may improve training models. In particular, the concept of expert learning as opposed to competency learning, should be explored more greatly. The accurate instincts that experts often use to make decisions may be developed through more tacit, holistic means than is currently recognized. Soldiers who quickly learn to adapt in the intense environments they face in Iraq and Afghanistan, despite a lack of formal training, may serve as an excellent population for researchers to further study the development of instinct. Finally, Gardner's theory of multiple intelligences indicates that a person's inherent abilities can greatly influence learning. While not addressed in this paper, it may be useful to look at the impact of recruit quality and retention policies on the development of the adaptable yet competent soldier.

Extraordinarily adept junior soldiers currently fighting our nation's wars already fill the ranks of world's most capable Army. Daily, they successfully accomplish more diverse and challenging tasks than an American soldier from twenty years ago would ever have imagined. To

¹¹⁴ See Klein, *Sources of Power*. His research indicates that experts use this process most of the time.

continue to meet today's and future challenges, the Army must do exactly what it calls upon its soldiers to do: adapt. Just as our Army depends on flexible soldiers to fight and win our wars and the peace, our soldiers rely on an Army system that transcends stagnancy and bureaucracy to meet their sustainment and development needs. Our soldiers and our nation deserve no less.

Appendix A: Program Strengths, Weaknesses, and Recommendations

Learning Guideline	Current Program Strengths	Current Program Weaknesses	Potential Program Strength	Potential Program Weakness	Recommendation
Varied learning environment		Tends to rely on behavioral approaches for all training	Uses behavioral methods in WT; cognitive methods in AVT		Adopt MSS Concept of varied learning environments
Behavioral methods for skills mastery	Uses discrete, controlled events for skills training; reinforced in AIT	Adds training requirements but does not allocate additional training time	Uses discrete, controlled methods in WT; emphasizes reinforcing combat skills	Adds training requirements but does not allocate additional training time; no specific reinforcement in AVT	Retain current concept of behavioral methods in BCT with reinforcement in AIT; consider allocating additional training time for additional tasks
Active learner involvement for adaptive learning	Scenario driven training provides experience base	CATS strategy encourages adoptive learning regardless of situation; DL courseware for self development is adoptive	Scenario driven training provides experience base; teaching of common principles that can be adapted to equipment in AVT is active	CATs retained; does not advocate that DL methods be changed	Retain scenario driven training approach; apply active cognitive methods as appropriate in AIT; Determine purpose of self-development; evaluate DL as a method of achieving goals
Active instructor role	Developmental counseling provides consistent feedback; SGI training introduces active concepts; DL can provide immediate feedback	Centralized training development hinders instructor flexibility; inadequate instructor development; limited dialogue in DL	Recognizes that instructors are not trained adequately; identifies need to link training developers and instructors	Does not specifically advocate Developmental counseling; does not advocate that DL methods should be changed	Retain developmental counseling; expand instructor development; determine purpose and use of DL for self-development
Motivation	Real world scenarios, developmental counseling, and squad training may increase motivation	Behavioral approaches can be boring; restricted human contact in DL	Real world scenarios; squad training, and appropriate cognitive approaches may increase motivation	Does not advocate that DL methods should be changed	Retain use of real-world scenarios; use varied learning environment as appropriate; evaluate use of DL
Socialization	Squad training approximates the work environment and provides for shared learning	Formal environment may interfere with adaptive learning; restricted human contact in DL	Squad training approximates the work environment and provides for shared learning; AVT more informal to accomplish adaptive thinking	Does not advocate that DL methods should be changed	Retain squad training; incorporate more relaxed cognitive learning approaches when appropriate; evaluate use of DL
Metacognition	Identification of TLOs and ELOs help map skills; use of developmental counseling and AARs	Learning objectives not identified for DL		Did not discuss use of LOs, developmental counseling, or AARs; does not advocate changing DL methods	Retain use of TLOs, ELOs, developmental counseling, and AARs; evaluate use of DL
Continual Learning	Emphasized as important	Treated as a block to be checked; high optempo may hinder self-development; may encourage surface learning	Expands importance of self-development	Treated as a block to be checked; high optempo may hinder progress; may encourage surface learning	Retain emphasis on self development; provide educational opportunities; evaluate use of DL

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