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The mind and spirit are decisive weapons

La mente y el espíritu son armas decisivas

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ABSTRACT. Everything that is done in a military's learning has an impact; understanding it allows leadership to make informed decisions based on verifiable observations and valid scientific reasoning. This article provides a learning philosophy to drive the evolution of service members from recruitment through retirement and the proficiency of units. Learning is a foundation that can be used to inform leaders on the development of leadership traits, problem-solving skills, and intangible attributes valued by military leaders and documented in the history of successful military organizations—that win in war. Learning can be verified and validated. It can bring specifications for tasks, conditions, and standards into a keener and complete correspondence with doctrinal requirements not only for training and education but also self-development within the military.

KEYWORDS: army transformation; Auftragstaktik; military decision-making; military education; military leadership; military learning; mission command

RESUMEN. Todo lo aprendido en la formación militar genera un impacto, y la comprensión de esto le permite a los líderes tomar decisiones informadas basadas en observaciones verificables y razonamientos científicos válidos. Este artículo proporciona una filosofía del aprendizaje orientada a enriquecer la formación militar (del reclutamiento a la jubilación) y la capacidad de las unidades. El aprendizaje puede ser verificado y validado, lo cual sirve de base a quienes están al mando para identificar los rasgos de liderazgo, las habilidades para resolver problemas y los atributos intangibles documentados en la historia de estructuras militares exitosas. La validación del aprendizaje también permite identificar condiciones y estándares que se correspondan de forma más íntegra con los requisitos doctrinales tanto para el entrenamiento y la educación como para el autodesarrollo dentro de las fuerzas armadas.

PALABRAS CLAVE: aprendizaje militar; decisiones militares; educación militar; liderazgo militar; mando tipo misión; toma de transformación del Ejército

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The art of learning

The purpose of learning is to make servicemen/women and units more combat effective. Period! Successful enterprises base their grand strategy on knowledge. They recognize that their competitive power is what their people know how to do as individuals as well as in groups. These skills allow them to develop, acquire, or partner with the other elements they need. They place their focus —*Schwerpunkt* (Focus of effort)— on continually improving technical and leadership skills both individually and as a complex collection of teams and groups (Boyd, 1988). They can prove it by documenting the resources they spend, including executive attention, on improving the acquisition and flow of knowledge. We are *not* living in an Information Age; information by itself is useless, sometimes wrong, often misleading, and always expensive to acquire and store. Knowledge, or better yet, wisdom is essential, and we only obtain that through constant, evolutionary learning (Bousquet, 2009, p. 187). Instead, this is the *Cognitive-Age*; this is the age of infinite complex problems needing continuous solutions.

Learning has evolved to a point where the distinction between training and education is no longer useful. On the traditional battlefield, training prepares a professional, and more specifically, a unit, to deal with expected situations. Education prepares decision-makers to deal with uncertainty. On the full spectrum battlefield, professionals know that they will have to be capable of performing specific tasks and following their orders to survive. However, they will also be expected to demonstrate the resourcefulness, initiative, creativity, and inventiveness demanded by the battlefield where confronting the unexpected and new is routine (Stewart, 1992).

Learning for *Full Spectrum Warfare* (Martin, 2010) must develop these skills as well as those associated with traditional tactical tasks. Likewise, professionals studying in a classroom will have to have access to virtual and synthetic environments that immerse them in a simulated battle closely resembling real war. Thus, the nature of modern war and technology is challenging the traditional concepts of training and education and causing them to merge into a new form of learning. We describe the confluence of training and education as learning packaged into the following two categories: training as field learning and education as institutional learning (Stewart, 2009)¹.

Moreover, learning to adapt to asymmetric threats requires that individual professionals and units develop new knowledge, skills, and abilities that are necessary for success but for which they have neither been trained nor educated. Conventional wisdom suggests that *we train for the known and educate for the uncertain*; this division is no longer adequate. To prepare a force to adapt, we must embrace all parts of learning and training, as well as education and experience within an uncertain environment.

1 Dr. Stewart is one of the leading scientists on how to develop adaptability.

However, the same thing does not work for everyone; everyone learns differently. The art is in that the Commander, Leader, and Teacher knows what to apply and when. There is not just one way to do it. People learn differently. Different solution skills are required from tactical to technical; tactical to dynamic problem skills are a whole different level. Undertaking learning correctly helps organizations form a learning doctrine that has to set the conditions to allow flexibility to the lowest levels of teachers in order for them to select the right approach to fulfill higher-level outcomes (Vandergriff, 2019, pp. 91-100).²

The final piece of the puzzle that an army or any professional organization must consider in developing future professionals is a rather complicated process. Substance is to substrate in emulsions as competencies are to capabilities in human development. How competencies combine with capabilities to produce development across time occurs through learning, but that is, in turn, dependent upon our senses –what we see, hear, taste, touch, and smell. Some would rightly add a sixth sense that defies rational explanation or concrete definition –intuition– that is, what we know or feel without explicit knowledge of how. Our senses provide the food for learning; they are the gatherers of raw information (Stewart, 1987, p. 20, 34, 45, 60).

Rote learning is the food not processed before it is stored

Learning Research has shown that humans can only deal with about seven raw pieces of information (number, letters, among others) at one time. Given this limitation, people develop conceptual strategies that store higher orders of information or datum in the form of *concepts* and process them further into concepts of yet higher orders, pillaring one conceptual layer on top of the other. Rote learning occurs in concepts (Gatto, 2001a, 2001b, 2010); someone else has processed the raw inputs constituting them, or the receiver can process the information into a higher order. Learning consists of both processes, but one is passive and the other active (National Health Forum, 2000).

With this in mind, Dr. Gary Klein tells us that the most frequent type of decision-making for leaders in a time-critical environment is recognitional, which requires a large amount of experience. Research also tells us that competence in decision-making is solidified by making many decisions in a stressed environment with adequate feedback and time to reflect and then try it again under different conditions; this develops intuitive decision-making. In the formal learning and field environments, short of combat experience, this is gained through frequent problem-solving exercises using tools including tactical decision games, forcing cases, *kriegspiel* (wargames), free play force on force exercises, and forcing staff rides, all followed by reflection time and constructive After-Action Reviews or AARs, accompanied by research and writing (Klein, 1998, p. 16).

2 This is called the learning doctrine of Outcomes Based Learning or Outcomes Based Training and Education, which is to learning what Mission Command is to Operations.

Intuitive Decision-Making Education, what we know today as the Constructionist theory of learning, is based on Johann Pestalozzi's Method of Teaching. Pestalozzi was a Swiss educator and the inventor of Kindergarten. In the late 1700s, Pestalozzi developed his theory that students would learn faster on their own if allowed to "experience the thing before they tried to give it a name" (Gudmundsson, 2018a)³.

More specifically, Pestalozzi methods educate leaders on how to identify the core of a problem, and then deal with that centerpiece of the problem without "wasting time working their way to finding a solution." German officer cadets and officers called this approach "Kindergarten Tactics." Taking ownership of the learning by the student is key to lifelong learning and understanding, prior to them being told the doctrinal or official term. They discover it for themselves and give it a name—this is ownership of learning (Gudmundsson, 2018b).

Recent learning science confirms this approach, as the leading learning expert in the nation, Dr. Robert Bjork, Dean of the School of Psychology at the University of California Los Angeles (UCLA) has discovered. In Lindsay et al. (2006) *Remembering: Attributions, processes, and control in human memory: Papers in honor of Larry L. Jacoby*, Dr. Bjork reminds the military that there is room for improvement in its learning doctrine in his presentation "How we learn versus how we think we learn: Implications for the organization of army training." Bjork emphasizes:

As instructors, we can often be misled in this determination because what is readily available to us is the performance of our students during instruction, which can be a poor indicator of how much durable learning is actually occurring. If, for example, all we consider is the rapidity and apparent ease of learning during training and instruction, we can easily be led into preferring poorer conditions of learning to better conditions of learning. Additionally, as learners, it seems that we do not develop—through the everyday trials of living and learning—an accurate mental model, so to speak, of those operations that result in learning and those that do not. And, furthermore, we are fooled by certain indices—such as how fluently we process information during the re-reading of to-be-learned material—into illusions of learning and/or competence that then leads us to prefer poorer conditions of learning to better conditions of learning. (pp. 15-28)

We, as leaders at all levels, must understand that deciding when and how to close with an enemy may be the least important decision they make on an asymmetric battlefield. Instead, actions that build and nurture positive relationships (with a community, local leaders, and children) may be among the defining factors for success, along with the primary tools for containing an insurgency, building a nation or stopping genocide. True

3 Dr. Gudmundsson is the leading authority of Professional Military Education, and the author of several books that deal with military reform and transformation, as well as how the Germans, French, and English trained and educated leaders.

tactical prowess often entails co-opting the local population's will while shattering the cohesion of asymmetric adversaries.

The U.S. Military and most law enforcement agencies, with exceptions, have focused on the "Competency Model⁴," (Taylor, 1964, pp. 4-6) which produces leaders who are good at "what to think," but, as Bjork stresses,

When instruction occurs under conditions that are constant and predictable, learning appears to get what we might call contextualized. It looks very good in that context but doesn't support retention later when tested in other contexts and the learning acquired in the original context does not transfer well to different contexts.

In contrast, varying conditions of practice, even just the place where you study, for example, can enhance recall on a later test.

(...) if when trying to learn several things, you intertwine the learning of those things in such a way as to cause interference among them during learning, long-term performance on them will be enhanced.

This is the one desired difficulty that I am going to illustrate with experimental results (...) massing (such as cramming for exams) supports short-term performance; whereas spacing (distributing presentations, study attempts, training trials, etc.) supports long-term retention. (Bjork, 2015, p. 29)

Bjork's work, as it relates to evolving the current task-centric and process-centric approach to most current education, can be summed up in the following: Conditions of instruction that make performance improve rapidly often fail to support long-term retention and transfer, whereas conditions of instruction that appear to create difficulties for the learner, slowing the rate of apparent learning, often optimize long-term retention and transfer (Bjork, 2006).

The importance of a learning focus

Learning must always be accomplished. It is how one becomes adaptive. But first, we must define some key terms, as we have earlier, to further understand the focus on learning. Rapid decision-making cannot solely be taught in blocks of instructions in the classroom but continually reinforced through practice in the field and classroom. One builds upon the other in continual evolution.

Having members of an organization that are adaptive and have intuition is not enough to win wars, campaigns, or battles. Like other cognitive qualities, both are beneficial only when accompanied by two other characteristics: effectiveness and feasibility.

⁴ The Competency Model first appeared in New York City Schools in 1905. It was developed, and public schools patterned afterwards, on producing factory workers. You see it today in such concepts as "Leave No Child Behind," where students are trained for the test using memorization.

Having the ability to change things rapidly is not very helpful if those decisions lead to defeat. Thus, adaptability and intuition—which create agility in the ability to make rapid decisions—must be tempered by the fact that the new action must not only be helpful but will not cause greater difficulties than would have resulted if no changes were made. Similarly, rapid decisions are not a good idea if the other elements of the enterprise cannot do what is wanted. Both must be limited by what is possible in terms of time, space, resources, and human potential (Stewart, 1987, p. 20, 34, 45, 60).

Many people are not predisposed to be adaptive and have intuition; they like to be comfortable prescribing to set patterns and stay with familiar activities. The current training and education system molds professionals into a set of behaviors that prescribe to a set way of doing things through how we manage career timelines, how we award and promote. Most militaries have a culture that unknowingly and unintentionally teaches bureaucratic behavior. It would be good if we could only have personnel that naturally make rapid decisions (we know it as common sense), but there may be too few of them to fill the force structure, and in any case, most militaries do not know how to identify these people ahead of time very well. Therefore, what we have to do is teach people how to make rapid and sound decisions in their responses to sudden changes in the situation. We have to teach individuals as well as groups of people to be agile; this is not going to be easy (McGee, 1999).

Linear or non-linear. A place for both?

Today, most people are taught analytical decision-making, which involves collecting and analyzing information to generate, compare, and select an optimal course of action. It is linear and easy to teach. This method is based mainly on a logical analysis of a situation; this is the Military Decision-Making Planning (MDMP) process.⁵ Such analytical processes are extremely effective if given accurate information, a clearly defined goal, and a capable decision-maker. Learning in most US military and similar organizations is focused on training with decision-making, using the analytical approach (U.S. Marine Corps, 1997a, pp. 63-70, 81).

In contrast, we also create adaptability, which is defined as the process by which individuals and groups decide rapidly, almost instinctively, to changes in their situations. Adaptability and agility are closely related. Both of them lead to changes in missions,

5 The MDMP was introduced in the 1890s by Maj. Eben Swift. Major Swift translated a French interpretation of a German method used in tactical decision games. The French mistakenly systemized a tutorial device, and Swift broke the process into even more procedures. He created the famous five-paragraph field order. This formalism feeds an inward focus because the effort is now directed toward how the order is written rather than why it is written. Swift did not understand that the German method was simply an education tool to introduce students to the concept of harmonization and never left the introductory level. The flaw with the MDMP is that it forces staffs to focus on “checking the blocks” of the matrix instead of focusing on the enemy, mission, and commander’s intent. In fact, the enemy only occupies a small portion of the MDMP matrix.

plans, procedures, and outcomes, but a time dimension does not constrain adaptability. Individuals, groups, and institutions can and most often do adapt slowly to changes. Agility, on the other hand, implies a rapid adaptation to changes in a situation (the use of a battle drill, for example, to overcome a surprise ambush). It is this need for rapid, almost instantaneous changes that govern military operations (US Marine Corps, 2015, p. 4; Kline & Saunders, 1993, p. 24; Schmitt, 1999).

Adaptability is a cognitive quality, and it is non-linear. It cannot be assured by technology alone. Modern technology increases the tempo of war, but it does not assure adaptability. Adaptability has little to do with weapons, munitions, vehicles, platforms, or the things upon which war ministries have labored so long and lovingly. Adaptability must be the product of people who can face the unexpected with calm resolve while finding ways to turn the tables (Bousquet, 2009, p. 187).

Coup d'oeil!

Everyone says that intuition is a critical skill for future members. Carl Von Clausewitz (1984) in *On War* uses the term “*coup d'oeil*” to describe intuition, calling it a high level of situational awareness that the mind would ordinarily miss or would perceive only after long study and reflection. Clausewitz also termed this ability “genius,” with “appropriate intellect and temperament.” Sun Tzu uses similar descriptions, and tells leaders to understand this principle to have success in command (Clausewitz, 1984, p. 119; Tzu, 1963, p. 91; Lind, 1985, pp. 5-6; US. Marine Corps, 1997a, pp. 23-39).

Psychologist Carl Jung called intuition one of the four basic psychological functions: “[the] function that explores the unknown, and senses possibilities and implication which may not be readily apparent.” Any organization, in pursuit of transformation, needs to develop and reward intuition. Intellectuals from a variety of other professions highlight it as valuable and important. Intuition is a building block for several critical traits (Jung, 1971, pp. 12-20).

Daniel Goleman records that these traits range from self-awareness to social and relationship management. John Maxwell writes in his book, *The 21 Irrefutable Laws of Leadership*, that intuition is the result of a combination of natural ability, learned skills, and broad experience (Maxwell, 1999, pp. 23-24, 29). Professionals with intuition become readers of certain “intangibles,” recognized as critical to battlefield success. Individuals will be exposed to situational awareness, trend analysis, systems thinking, and consensus-building to build intuition. Armies will also be introduced to socially-oriented techniques, like developing a shared vision, to ensure that culture and values prevail amongst the organization’s members. In the end, this establishes a foundation for building strategic leaders.

In the past, the militaries relegated leader training, which was often not professionally challenging to all involved, to second place to other events. Developing adaptive

professionals to win in combat is the toughest of all professions, and cannot be treated as a club function. We cannot confuse adaptability with agility. An adaptive leader is “A leader who can influence people by providing purpose, direction, and motivation while operating in a complex, dynamic environment of uncertainty and ambiguity to accomplish the mission and improving the organization” (Defense Science Board Task Force, 2003).

Agility is defined as quickness, adaptability, and ease of movement, the ability to change and cope with massive uncertainties being a core competency. Change competency is measured in terms of five performance metrics, time, cost, scope, stability, and frequency. What better description is there for armies operating in today’s asymmetric environment? Like skilled athletes, servicemen and women will be called upon to adapt to changing conditions quickly and smoothly. Agility has also been described as “operating inside the opponent’s OODA loop” (Boyd, 1986, pp. 4-5).

We must teach our professionals the Hegelian Dialectic in which two opposite views can be synthesized into a superior response. To organize the energy of a conglomerate group into purposeful action, it is necessary to provide some *principles in education*; otherwise, everyone or subgroup will do different things. This may or may not be good in general, but when the focus of activity is on “making-mission,” and “inputs” (how many individuals we push through training) is the wrong outcome. While it is important to track, it is not the sole outcome to determine the success of a unit, course or school (Leland, 2010).

“Agile commanders, both mentally and physically, quickly comprehend unfamiliar situations, creatively apply doctrine, and make timely decisions” (US Marine Corps MCDP-1, 1997, pp. 56-64). Some think that when professionals learn, personnel must be empowered to plan and execute more learning events on their own. The U.S. and United Kingdom’s doctrine of *Maneuver Warfare* requires junior personnel to accept significant increases in responsibility, with combined arms forces migrating to the lowest levels of the organization. The issue is, does the way they learn, peacetime, and the garrison cultures they operate in reflect the way they will fight?

Barriers to a culture of learning

Most militaries don’t walk the talk.

Although doing well in military task training (core military competencies) –most individuals are competent at their individual and collective military task performance (skills in the tangibles)– they currently lack in the capacity to *think and do* confidently on the ground in an operating environment that is much more complex, expansive (in time, space, and context), and decentralized. Today’s operating environment is characterized as “the strategic implications of tactical actions,” though true, most militaries are not doing their best to ensure that its personnel fully understand and can *master* the impacts of their tactical actions to affect the strategic effects intended (Plamondon et al., 1999).

Servicemen and women *do* great things at ground level that have some strategic impacts, but they do not fully understand the strategic impacts of their actions and activities. If a military taught them and educated them holistically beginning at an early stage, they could not only understand the strategic purpose of what they do in the warfighter; they could learn to intentionally take certain tactical actions (civil-mil actions) to affect specific strategic effects. This is the personification of the “strategic corporal” that GEN (Ret.) Krulak, USMC, spoke of back in the 1990s.⁶

The profession of arms has this odd and illogical (irrational) culture of masking our persona (individual and collective) as *the simpleton* —“I’m just a simple kind of guy” is a favored lead-in and credo for many personnel. Our culture promotes anti-intellectualism (we do not want to be someone who can *think* because that must mean that we cannot *act* or *do*). The services promote the atrophy of the brain muscle, instead of building that muscle the same way we focus on building ourselves physically for war. War it is said is a young person’s game, adapt to the physical challenges of the business. Warfare is not for the old. It should also not be left to the weak of mind. The military culture appreciates a person’s *thinking-doer* capabilities. It is an oddity of the organizational culture that must be overcome (Defense Science Board Task Force, 2003).

In the *Foundations of the Science of War*, Chapter 1, page 20, J. F. C. Fuller (1926) states in his 7th endnote that “The confusion between the meanings of science and art in the head of the average soldier is most pronounced. They do not understand that ‘a science teaches us to know, an art to do.’” If you replace “the average soldier” with a military’s training command acronym, you get to the essence of the problem. Most training commands specialize in scientific management of *knowledge* (Taylor, 1964, pp. 4-6). They do not specialize in teaching the art of warfighting.

Unfortunately, this problem occurs across a nation’s military. In the U.S., all training and education are tracked via the Joint Professional Military Education (JPME) certification system. It appears that one of the underlying assumptions for the adoption of a systems approach to training/education was that the more a service-member *knows*, the more he or she can *do*. The truth is, as Heraclitus observed in 500 BC, in war, “out of every one hundred men, ten shouldn’t even be there, eighty are just targets, nine are the real fighters, and we are lucky to have them, for they make the battle. Ah, but the one, one is a warrior, and he will bring the others back.” This is true whether they just graduated from the War College or are fighting for ISIL with no formal education (Salmoni, 2008, pp. 12-14, 34-35, 40-43).

To complicate matters, there is now a perception that everyone who deployed in support of OEF/OIF/Resolute Support accomplished their mission, and everyone who

6 For further reading on Victor Krulak see “The Strategic Corporal in the Three Block War.” General Robert Neller, *36th Commandant’s Planning Guidance: Innovate, Adapt, Win*, (Arlington, VA: Headquarters, US Marine Corps, July 2015), p. 2; assessed at https://www.hqmc.marines.mil/Portals/142/Docs/2015CPG_Color.pdf

deployed is a hero. This perception disproves the above hypothesis and causes everyone to scratch their head when a true teacher is *abrasive*. In their minds, the scientific approach to training and education in the military has a proven track record. Even the U.S. Department of Education (DoE) that oversees all U.S. public school Programs of Instructions (POI) uses it with their *common core*. What could possibly be wrong with it?⁷

To make matters even worse, the trend in formal military schools are now tasked to basically “stuff 10 pounds of shit into a 5-pound bag without spilling a drop.” An *unofficial* analysis required by the U.S. DoD in 2018 of all existing Annual and Ancillary Training/Education found that in order to *know* everything required by order or directive, service personnel would have to train/teach 32 hours a day, 365 days a year. How is that even possible when there are only 24 hours in a day? It is not. The truth is that no one had ever looked at the requirements holistically. They just kept piling them on, making commanders responsible for what their units do (or fail to do). This delta between perception and reality continues to grow every time there is an allegation of rape, a DUI, or a suicide (Department of Defense, 2018).

If the *requirements* continue to increase to mitigate the *risk*, the U.S. Military cannot change; in fact, they will only get worse. It is not personal; it is systemic. The U.S. Military's entire infrastructure is based on the scientific management of *knowledge*, which breaks *doctrine* down into testable, quantifiable parts. Every subject is assigned to a curriculum developer (civilian, usually a retired SNCO or Officer) who arranges these parts into Terminal (i.e., testable) Learning Objectives (TLO) and Enabling Learning Objectives (ELO). Every hour of instruction is accounted for in the Program of Instruction (POI), with a constant eye towards the efficient transfer of terminal learning objectives –retention be damned– (Vandergriff, 2014, pp. 34-43).

That is why bold and great teachers are constantly told to “stick to the POI” whenever they attempt to improve retention and understanding among the subordinates outside of the formal lesson cards. Scientific managers probably view any methodology other than the Competency Theory as *inefficient* and hard to quantify and test. They also probably view these methods as a threat to their livelihood (i.e., Master Teachers do not need curriculum developers). Until both DoD and DoE dismantle their scientific management models, all reform efforts will continue to exist on the fringes. Why? Because every time a senior leader sees something innovative outside the use of more delivery technology, they ask, “is there anything we need to do to update our POI to reflect what he just taught?” The answer they get in return from their curriculum developer is “no, our POI is signed and certified; we cover everything required by doctrine.”⁸

7 See “Concept to Classroom,” <https://www.thirteen.org/edonline/concept2class/constructivism/>.

8 This is based on the personal experiences of the author.

War as a learning contest

What is the relationship between learning and warfighting? Is war chaos? But what is chaos? *Maneuver Warfare* is a doctrinal and cultural reaction to dealing with war as chaos. We have a proven model that allows us to deal with chaos, but we must learn to practice it again and again to master it (Kahneman, 2011, pp. 20-21).

Maneuver Warfare is a dynamic system, a semi-pattern behavior, patterns coming apart to recombine later. War is when you can recognize whether those skills apply or do not apply. When do we depart from the pattern that we have and create a new one? There is an approach that some professionals already know well for the last 30 years; however, we will revisit the OODA Loop, which is shown in Figure 1 (US. Marine Corps, 2013, p.73).

John R. Boyd demonstrated the power of making sound decisions promptly in his theory of decision-making. Boyd contends that human behavior follows a specific decision-making cycle. The four steps of the cycle consist of observation, orientation, decision, and action OODA loop. The side in a conflict that executes this decision-making process more rapidly and effectively gains an advantage over his opponent because the opponent will continuously react to his actions. These continued reactions eventually result in poor decisions followed by paralysis of the entire opposition decision-making process. The common expression of the successful execution of this procedure is getting inside the enemy's decision cycle (Boyd, 1986, p. 72).

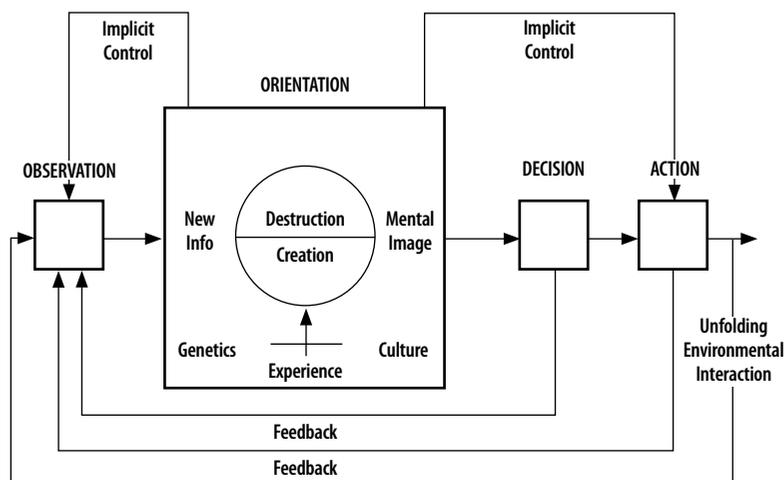


Figure 1. Boyd's OODA Loop.
 Source: U.S. Marine Corps (2013, p. 72)

The critical step in the OODA is orientation. In this step, analysis and synthesis of the observations occur. The process consists of taking many different disparate nuggets of data and information and translating them into a mental picture, which the decision

maker can then use to decide. Boyd refers to this as “examining of the world from a number of perspectives so that we can generate mental images or impressions that correspond to the world.”⁹

The OODA Loop gains its power from the ability of a leader to form mental constructs. Timeliness and accuracy of decisions and actions relate directly to the decision-maker’s ability to orient and reorient to rapidly changing and uncertain situations. Personal experiences, education, and training (a.k.a. knowledge) empower the leader to form these mental constructs (Vandergriff, 2006, pp. 50-66).

Boyd’s theory emphasizes the importance of the ability of leaders to think. By-the-book answers to specific well-known situations are not good enough. It is the ability to think that allows a leader to take the knowledge from personal experiences, education, and training and adapt it to the imperfect information of the present situation to arrive at a timely, sound, and workable solution to that situation (Boyd, 1986, p. 72).

Applying the OODA Loop faster than the opposition is the essence of situational or intuitive decision-making. It is the means of quantifying a mental process into a mechanical action that all leaders can understand and apply. Decision-making superiority is merely creating a tactical decision-making base in the operating environment (Stewart, 1987, pp. 20, 34, 45, 60).

An intellectual edge in warfare

Today the U.S. military is untouchable at how it trains its members to accomplish tasks. Commonly referred to as “Task-Condition-Standard,” using the “Crawl-Walk-Run” methodology has worked well in the past to train its personnel for battle. At one time, the U.S. Military’s training doctrine was the right method for preparing mobilized thousands for war. However, since the time that the doctrine delivered the mobilization that the national military needed, war has evolved in scope, as well as how our opponents fight and the type of opponents we face.¹⁰

The U.S. is developing its joint and expeditionary capabilities against peer and near-peer threats. So, doesn’t the learning doctrine evolve alongside it too? There are signs that they are beginning to move from the Industrial Age to the Cognitive Age (Berger, 2019).

Based on the expeditionary paradigm, the U.S. military no longer has the benefit of having a learning paradigm focused a peacetime individual-centric career pattern, which shift training to a combat focus when the need arises. Leaders must be immediately capa-

9 Theoretical and empirical support for this possibility comes from some domain- general decision-making research, as well as some wayfinding Research. See https://www.researchgate.net/publication/235418838_A_Recognition_Primed_Decision_RPD_Model_of_Rapid_Decision_Making.

10 According to the article “Importance of Psychomotor Development for Innovation and Creativity,” retrieved from <http://www.ijpe.online/2012/psychomotorh.pdf>, “the affective group by emphasizing the human desire for (...) importance of the development of the cognitive and affective domains in fostering creativity in combat is paramount to a unit’s success.”

ble of conducting simultaneous, distributed operations. All leaders must be prepared to operate in all environments with a greatly expanded range of operations and skill to some minimum standard (Reed, 1996, pp. 56-60).

The minimum standard of preparation that results in successful military operations is adaptability in its members and units. The naturalistic decision-making method of Recognition Primed Decision-making is a critical skill for staying ahead of a protagonist and anticipating and recognizing events and situations and making decisions that are of a high risk/low time nature. RPD decision-making requires an appropriate broad base of knowledge for adaptability (Savery & Duffy, 1995, pp. 31-38).

The essential relationship between learning, capability, and performance

The contrast between the Pestalozzi approach and today's "crawl-walk-run" or "lecture-demonstration-practical application" system used in leader development curriculums is dramatic. This contrasting Industrial-age approach was born out of necessity in World War I. The American Expeditionary Force (AEF), arriving on the field of battle unprepared for large-scale war, followed the French approach based on the Descartes method, which evolved into the MDMP analytical decision-making and merged with the Army's approach to leader development (Pershing, 1995, pp. 31-38).

Both the analytical and heuristic methods have an appropriate place in the world of decision-making. Analytical decision-making is strongest in situations that are unfamiliar to the decision-maker or when there is enough time to apply a full, in-depth analysis to the problem to find the best answer to address it (Darwin, 2008).

Heuristic decision-making, as exemplified by the recognition primed decision-making model, addresses situations where time is not available, and a solution is required for immediate implementation. One is not necessarily better the other, and the choice of which process or even a combination of processes to use should result from the situation presented to the decision-maker.

Of the two types of decision-making, the analytical process is easier to train the inexperienced to execute. Most militaries dedicate ample training time in its professional schools to teach officers and non-commissioned officers an analytical planning process (step by step, follow the checklist or process). The planning process is a great equalizer. It affords a common method for solving problems and making decisions by individuals possessing knowledge and experience, from the novice through the expert. Its use should produce optimal solutions to the problem or, at worst, produce infallible plans (Vandergriff, 2007, pp. 30-39).

However, many of the decisions required in the field of battle or field of peace must be accomplished quickly and under stressful conditions. In this environment, the RPD

model of decision-making provides the best method of operation. However, an inexperienced and ignorant decision-maker probably will not make the most effective decisions using this model and will often produce plans that fail. The best RPD decision-makers possess a vast array of knowledge and experience from which to draw courses of action. The drawback is the amount of time required to acquire the requisite knowledge and experience to conduct effective decision-making in this manner (Klein, 1998, pp. 16-20).

The decision-making method best suited for low-time/high-risk decisions is a naturalistic/heuristic method, exemplified by the recognition primed decision-making process. Quickness in the choice of a workable solution to a problem is the critical component. A key aspect of this decision-making method is pattern recognition. It requires a sizeable personal database of knowledge for the decision-maker to be fully effective in identifying patterns in a situation and adapting an appropriate solution to it.

The implications of this are clear. The military must start to develop intuitive decision-making skills among its members, and the earlier, the better. It is also important to recognize that, while conceptually opposite, the two models are mutually exclusive in practice. It is possible, for example, to incorporate analytical elements as time permits into what is essentially an intuitive approach (Defense Science Board Task Force, 2003).

Implications of *maneuver warfare* on learning

There has been much debate about maneuver warfare over the years. Is it a mindset? An art? A philosophy? A theory? Or is it one of two styles of warfare? (van Creveld, 1994, pp. 1, 3-7)

The six tenets of maneuver warfare ripple throughout an entire doctrinal publication called the Marine Corps Doctrine Publication-1 Warfighting and in U.S. Army doctrine publications (Wass de Czege, 2019), as well as mentioned in other publications, yet its format relegates these words to a single chapter entitled “Styles of Warfare.” Some have pointed out that *Maneuver Warfare* existed long before it had a name, so do we really need to name it at all? We would argue that the exercise of naming things has been an essential first step to progress, much like naming lifecycle phases, animal kingdoms, or months of the year. Naming leads to recording, which then leads to eventual study and improvement (Wong et al., 2003, pp. 2-3, 42-43).

Both warfighting styles –maneuver and attrition– serve useful purposes and are never present in battle in their pure form separate from each other. The experienced warfighter knows when and how to apply both as the situation dictates. We will not emphasize one over the other, only mirror what is depicted throughout official U.S. Doctrine.

Since any development is a continuum of sorts, we will present our warfighting capability in a format referred to as a capability maturity model. It reflects the types of things a leader *does* to demonstrate their aptitude at each level according to what Maneuver Warfare determines to be an effective warfighter. It is *not* a list of training programs or

events they must complete; it is *not* intended to be a checklist, only a representation to help align a military's Learning Doctrine to its Warfighting Doctrine. While we are not opposed to checklists per se, we realize that there is a time and place for them, and this is not it (Stewart, 2009)¹¹.

This capability maturity model ultimately describes the desired capabilities of leaders at all levels. Like the warfighting doctrine, the learning doctrine is developed for officers and enlisted alike. Other more detailed models could align with this model, as the need arises.

This model focuses on the horizontal levels, not the vertical. The vertical levels are not prescribed in our doctrine, though it does subtly use the word apprenticeship to express the idea that warfighting skills take time to develop and master. As such, a learning doctrine will not ascribe ranks to the verticals because it is more practical to assume that personnel could be a novice in one area and approaching journeyman in another, based on their independent study, opportunities, and experiences. Their primary purpose is to show progression. To develop these levels, a learning doctrine groups different attributes that closely support a common theme. Then, for each attribute, a learning doctrine ascribes behaviors and actions for each level of maturity. The themes do not lift from the doctrine so neatly as the attributes; thus, a learning doctrine will take some liberties naming them (Stewart, 1987, p. 20, 34, 45, 60).

Maneuver Warfare is the primary source for this model. Sometimes, defining what something is not is just as illuminating as describing what it is. Maneuver Warfare does a fair job of painting a portrait of the expert by describing and contrasting foundational skills with advanced skills. A learning doctrine that supports Maneuver Warfare would attempt to do the same here, borrowing heavily from our doctrine and other sources that illustrate incremental aptitudes that help fill in the gaps of a military's continuum, but do not introduce anything new or contradictory (Marken, 2008, pp. 1-3).

There are clear indications that leaders need to improve. Various groups act wherever they identify the need, but these are isolated efforts that fizzle once the brain trust turns over, retires, or loses its contract. Initially, this model intends to aim attention towards a common sight picture and, ultimately, a common objective to accelerate the tempo and stimulate more coordinated actions with longer-term results, something that is not done independently. Eventually, a doctrine of learning uses it to stimulate discussions on ways to evaluate decision-making during exercises and wargames, for example. Tangentially, it may also be useful in providing leaders with an early glimpse of their trajectory as a warfighter and encouragement to maintain or kick-start their self-study. This model does not strive for a perfect picture, just the maximum effect (Swartz, 1976, pp. 246-257).

11 Dr. Stewart is one of the leading scientists on how to develop adaptability.

Implications of warfighting philosophy on how leaders make decisions

If we believe Maneuver Warfare is the way we want to fight, it requires high levels of judgment, decision-making, and adaptability. The U.S. military uses these phrases and words all the time, and its leaders read about and can talk about it. If the U.S. military claims that its people are doing it as we speak, then, many will ask, “What is the problem?”

While most militaries talk a lot about adaptability, their cultures develop confirmatory, especially in the way it develops leaders—today’s leader paradigm is a combination of education, training, but more specifically how it promotes and selects. The latter two have the most significant impact on the shaping of leaders in today’s military.

This is far from a criticism of today’s personnel. Today’s leader development paradigm establishes a solid grounding in analytical decision-making. Unfortunately, this process dominates the curriculum of most military courses and unit field exercises. While the objective is to create professional military members that can make sound decisions, today’s and future operating environment demand something different. It is important to define the decision-making, decisions, two decision-making models, and how these definitions fit into adaptability.

Leaders of character make decisions and take responsibility

Decision-making is central to the military; from a soldier firing a machine gun within his assigned sector to a general maneuvering a division. A serviceman or woman who is incapable of making a timely decision or uses poor judgment is a person places the mission and other service personnel in jeopardy. The essence of effective leadership is to make and communicate sound decisions. Active service personnel applies analysis and synthesis as required by the situation rather than applying templates to problem-solving. The requirement for leaders to make and communicate sound decisions is not new to the military. The military has focused, with great success, on developing effective combat personnel.

The future military will require personnel to make decisions in a full spectrum of differing types of operations. War embraces the full spectrum. However, the personnel of most militaries does not traditionally prepare its leaders to conduct this type of operation until an impending mission requires it. Most military-centric courses and institutions concentrate on preparation for the execution of close combat. Unless directed otherwise, doctrine drives course directors to focus time and resources on training combat tasks.

Given the diverse emerging threats and mission requirements, a deviation from this focus may be required. However, this diversion of focus to non-combat related tasks will be temporary and only exercised when preparing for anticipated missions. The reality is that it is not possible to anticipate many of these missions. Nevertheless, many leaders have adapted; they had to. The concern is the many that have not adapted or are unpre-

pared to make sound decisions in a rapidly changing environment. This paper intends to help those in the military who deal with leadership and show them how to teach decision-making and develop adaptability.

The Future

Understanding how to develop and nurture adaptability through learning must be undertaken, in concert with extant a military's plans for revamping their learning doctrine for the operating forces and the institution itself to produce future leaders who will have the frame of reference (FOR)¹² necessary to change the military culture in the ways suggested next.

Adapt the model of development suggested in favor of alternative approaches that have not achieved the ends intended for at least two generations, if not more. At the strategic, operational, and tactical levels, these teachings need to focus on the essential elements of development, as defined here, and as suggested from the best available findings of human development and transformation available today.

Develop measures of both the essential elements and their behavioral manifestations. Measures of emotional development (ED-maturity)¹³ and cognitive development (CD-critical and creative thinking)¹⁴ exist but should be *user-friendly* and usable on a military wide-scale basis. Metrics cannot be the current evaluation cards used by the military, which are very complicated and compels leader observers to focus on the card and not the actions of the military and their units.

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- 12 These competencies, factors, skills, and abilities are terms used to characterize a state-of-being. A leader should be and do X, Y, & Z. Thus, X, Y, and Z are one set of behaviors that spring from what we call a developmental frame-of-reference. One might say that there are about as many frames-of-reference as there are people. However, here, we are using the term more stringently, meaning what flows from specific developmental levels (Kegan & Freedman, 1983; Keegan, 1994; Demick & Andreoletti, 2003). Such stages describe how an individual views the world by constructing his or her "real" world, from the inside outward. Developmental levels are intrinsically associated at different times in our lives. Research shows that individuals' FOR changes as they mature, and it is the fountainhead from which many characterizations of what people do may flow. The Army can speak of a center of gravity that determines all the manifestations of a current knowledge state (Lewis & Jacobs, 1992) with cognitive dispositions and together with them form what we refer to as a frame-of-reference. This internal FOR is what leads us to be of a particular order of mind, to say, be, and do.
- 13 Emotional Development (ED), also a vertical (across-time) growth process, is all about how comprehensively the individual has a grasp on himself or herself, and, therefore, of others as well. It reflects a person's center-of-gravity or the center of their emotions, actions, and decisions at some point in time. Whereas Cognitive Development (CD) determines the scale and scope of problems and operations an individual can effectively take on, ED determines, mainly, why they do something –motivation–. Simply put, it is all about "*What should I do and for whom?*" Successively, a higher achievement on this dimension determines how objective the individual can be about their strengths and limitations, which also reflects how open they are to learn and discover about themselves and others. According to ED logic, people's self-identity and feelings of self-worth are defined by two distinct perceptions: their own, and what they believe others think of them, especially the views held by significant others.
- 14 Cognitive Development (CD) is critical to sound judgment in novel and complex situations. Sound judgment depends on reliable intuition and *thought models* to sort the routine from important problem nuances that demand critical thinking and creative solutions. Relational skills are critical to persuade and lead, negotiate, and settle disputes, as well as for cooperation and teamwork.

Implement a new tool for metrics that can be a plain card with just a printed name, mission, time, and evaluator. The rest should be space to write observations. Over time, these observations of demanding situations that require adaptability will provide a measurable evaluation of adaptability. Clearly, if we cannot measure the essential elements, they do not matter; hence, we must find ways of measuring these elements for two purposes.

- Intensive confidential individual assessment, feedback, and development planning at each schoolhouse entry or career gateway. The idea is to provide the foundation needed to guide development during the educational experience and in follow-on assignments.
- Systemic feedback. Each member should be anonymously assessed at each gateway point to provide a feedback loop at the systems level to determine if the programs and processes set in motion are having their intended effects. This will provide an interlocking chain of continuity to each service person's development from the time of boot camp or pre-commissioning onward. With such a continuity thread, it will be possible to monitor progress towards the objectives. Generically, the crucial question is developing the military's talent at the required time and place in terms of the essential elements.

Establishing a blend of instructional methodologies to use, particularly in the institutional setting, is critical to promoting synchronous growth in CD, ED, and, consequently, knowledge development (KD-learning).¹⁵ Current instructional approaches lack opportunities for experiencing the *emotional trauma of failing within a safe, face-saving environment*, which is needed to promote ED. The methodologies' coequal focus must be on CD to teach critical and reflective thinking, or how to think, replacing the overall emphasis on what to think (content) to allow building richer and deeper understandings of the self and alternative worldview; an understanding that will enrich one's own.

From the outset, a modern military's highly technical environment demands an emphasis on transformation, on growing by learning-to-learn, not on information alone. This paper has focused on the *what*. However, there will be sequels to address the *how*, which is critical to the eventual overall success of these recommendations. In many senses, the how is a more complicated issue, but evidence exists that gives us substantial clues about what its nature must be.

15 Knowledge Development (KD) represents the combined product of Cognitive Development (CD) and Emotional Development (ED) and is the platform for Frame of Reference (FOR), the outcome state that, in turn, defines our patterns of behavior. CD and ED are the vertical growth dimensions, and the nature of their nexus is critical to leader development. Another way of stating this is by way of an old, familiar adage that what is not thought 'in your gut' is not thought thoroughly. Whatever is transferred out of CD is abstract knowledge, in the same sense that grammar constitutes abstract knowledge (competence) in contrast to speech (performance) in real-time. *Performance* has an experiential component, *competence* does not –learning to ride a bicycle from a book without ever mounting one represents the CD component while riding it provides KD's ED complement.

The only way that a military can produce future leaders with the wherewithal to define and develop a *Culture of Innovation* is from inside the individual out. It will only be possible by growing a cadre of people with a more advanced frame of reference than that which evidence suggests exists now. Thus, the transformation that our recommendations envision will take place over a protracted period as the next generation is produced. If a military starts in earnest to focus on development now, as we have described it, rather than on its manifestations (behavioral *eaches* or meta-*eaches*), the serviceperson can reinvent itself in the ways that current trends suggest; the Maneuver Warfare culture that *MCDP-1 Warfighting* envisions with an emphasis on *Mission Command*, both in the institution and the operational forces.

If the military truly wants to raise itself to the next level, it must be prepared to grow a new, more advanced leader at all levels, and marshal the *military continuity*, a sustained, dedicated, and focused sense of purpose, necessary to make it happen. If the military culture mirrors more than less the culture at large, it will never produce the change it seeks: a culture supportive of the Profession of Arms, where mistakes are measured in lives, not dollars. Western militaries have the talent if only the institution would take the initiative and engage the appropriate, extended effort required to develop it.

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