Integrating Design into the Soldier Culture

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Abstract

Since TRADOC's creation in 1973, the Army has focused on task-based instructional methodologies for its primary workforce: junior enlisted, non-commissioned, and company-grade officers. The Nation's unrelenting scrutiny of Soldiers compared to similar age and socio-economic populations combined with the escalating peer/near-peer threats necessitate Soldiers to operate heroically in uncertain and often artificial environments. The operational environment requires soldiers to perform skill-based tasks with the cognitive application of the commander's intent and instinctual behaviors, which are evaluated by the affective domain. The current skill-based task training or high-paced knowledge-based education may be inadequate for the future fight—or even the current learning environment of the generation serving in the junior ranks. Some training environments effectively simulate complex, high-stress situations that force affective reactions but lack sufficient feedback and development. It is time to dust off an older theory about how the world works, as it may be more applicable to the current problems of the day. *Sciences of the Artificial* was a lecture turned book by Herbert A. Simon (1969). His study of the artificial world and the complexities arising from the interface of natural and artificial environments form the basis of modern design thinking. The Army's current capacity for design thinking is immature and severely compartmented. Design education is limited to the Army's most senior noncommissioned and field-grade officers and is limited to planning military operations. People-centric design frameworks must culturally augment operational art mindsets. The early integration of practical design thinking education is critical to the Army's decisive success in war and peace.

Introduction

> The world we live in today is much more man-made or artificial than natural. Almost every element in our environment shows evidence of human artifice. The temperature in which we spend most of our hours is kept artificially at 20 degrees Celsius; humidity is added to or taken from the air we breathe; and the impurities we inhale are primarily produced (and filtered) by man (Simon, 2019, p. 2).

Organizations are artificial systems in the sense that they too are created a step away from humankind's natural tendencies. Therefore, as we try to enable integration between people, processes, and the organization's purpose, we find several factors that prevent or impede an organizational culture of learning or improving. If not considered in strategic organizational decision-making, these factors may foster counter-productivity and diminished professional momentum. The United States Army faces these dilemmas as evidenced by recruiting and retention rates, decline in esprit de corps, criticisms of lack of military expertise, and declining trust between the American people and their Army and Soldiers. These dilemmas relate directly to "the characteristics of the Army Profession: Trust, Honorable Service, Military Expertise, Stewardship, and Esprit de Corps" (Department of the Army [ADP 1], 2019, p. 1-2). "These characteristics of the Army Profession reflect our national ideals, the Army Values, the Army Ethic, and the Army's approach to accomplishing its mission to defend the Constitution and the American people" (Department of the Army, 2019, p. 1-5). The Army is a "…unique vocation of experts certified in the ethical design, generation, support, and application of land power, serving under civilian authority and entrusted to defend the Constitution and the rights and interests of the American people" (Center for Army Profession and Ethic, 2018, p. 8).

> Our leaders, then, are going to have to be self-starters. They will have to have maximum amounts of initiative… critical thinking skills… [and] character so they make the right moral and ethical choices without supervision under intense pressure in combat (Milley, 2018).

The Army must prioritize design educatio*n* in all decision-making processes at all levels to sustain a competitive advantage in the operating, generating, and supporting environments. The early integration of practical design thinking education is critical to the Army's decisive success in war and peace.

Design

The Army Profession Pamphlet (2018, p. 23) states that the Army profession characteristic of “military expertise is the ethical design, generation, support, and application of land power. This is how the Army contributes honorable service in defense of the Nation." The principal guidance of what the Army considers “design [methodology]” is found in Army Technical Publication 5-01.1, “…part of a continuing effort focused on improving the critical and creative thinking abilities of leaders and teams to understand and solve problems” (p. iii). The methodology for solving any complex problem is geared toward solving the cause of the problem and not just the symptoms of the problem (p. v). Furthermore, the ethical design of combat operations must always be complemented by ethically designed decision-making in the generating and support roles at all echelons.

ATP 5-01.1 is geared toward solving complex, ill-structured problems in the operating environment. The basic model for solving these complex problems involves contextualizing or framing the operating environment (current state), identifying or framing problems related to achieving a desired operational effect (desired end-state) and framing solutions. The Army Design Methodology describes design thinking using principles of understanding context, human-centered approaches with iterative and cyclic planning processes, and diverse collaboration. The model is continuously analyzed, but the decision maker may reframe problems and solutions as variables change in the operating environment. Once the planners have an in-depth analysis of the operational environment to understand the context and nuances of the problem and have synthesized potential solutions, the operational solutions can enter the Military Decision-Making Process (Department of the Army [ADP 5-0], 2019).

The Army adopted the basic premise of Army Design Methodology for improving organizational performance. Codified in ATP 6-01.1, Knowledge Management uses the concepts of [organizational] current state and [organizational] desired end-state to align people, processes, tools, and technology to improve the organization based on the process steps of assess, design, develop, pilot, and implement (2024).

Thousands of Army publications address the design of specific technical applications in the generation or support of our Nation's combat land power. From the design of bridges and base camps to the design of operational warfighting experiments, pre-established processes based on years of best practices and lessons learned guide leaders every day. However, technical guidance cannot account for the exponentially rapid development of complex technologies, socio-economic adversities, and advanced peer and near-peer threats in domains no longer dominated by the American superpower.

How does the Army “train” design thinking?

Training

All Soldiers require training. Training is typically associated with performing tasks required to accomplish doctrinal missions or activities. Task-based training is typically evaluated with a "GO/NO GO" performance evaluation based on established standards. A simple review of Field Manual 7-0 demonstrates that training is a commander’s responsibility and is usually planned and managed at the company level. Organizational commander’s resource training one echelon down and evaluate training two echelons down (Department of the Army, 2021, p. 1-2).

The Army trains individual and military occupational tasks at the institutional level primarily to enlisted, warrant officer, and company grade officers at Initial Military Training (IMT) courses, branch-specific courses, and Professional Military Education (PME). Basic combat training and advanced individual training are nearly all performance-based tasks. Some branches require advanced skills requiring prior education, experience, or a proven aptitude for specific skills.

> Individual training is developing and sustaining skills and proficiencies at the Soldier level. Soldiers train on individual tasks consisting of observable and measurable individual activities and actions. Individual training works with collective training to develop effective Soldiers and units. Soldiers gain confidence, and units build competence as Soldiers hone their individual skills. Confidence and competence combined are imperative to the conduct of unit collective training. Unit-level training proficiency is directly tied to soldier proficiency—the sum of the parts is equal to the whole (Department of the Army [ADP 7.0], 2024, p. 1).

Again, the Army sees training as task-based performance assessed on a calculated acceptance of proficiency. The Army's educational framework supports the continuous development of Soldiers and leaders by aligning with the Army Leader Development Model. This model emphasizes the interaction between operational, institutional, and self-development domains to achieve comprehensive training and leader development goals. Education, as part of this model, is designed to equip individuals with the intellectual capacity to understand and navigate complex security environments, thus enhancing overall readiness and effectiveness (Department of the Army [ADP 7.0], 2024).

Education

ADP 7-0 states that education "provided at Army institutions gives Soldiers the fundamental knowledge and information necessary to understand standards and perform effectively" (2024, p. 1). This definition is a task-based understanding of the application of knowledge or information. In the Army Publishing Directorate database, there are only twenty-eight references to education in doctrine. Most refer to "education training."

Mission Command doctrine states that "successful commanders develop skill in each element through maturity, experience, and education" (Department of the Army [APD 6-0], 2019, p. 2-1). We begin to see that the doctrine that describes the competencies of commanders or Soldiers with professional competencies refers to the importance of education. However, the doctrine that pertains to the execution of common tasks refers to the importance of training. Does the language matter?

Mission Command doctrine does not define education specifically, but it does suggest that education is critical for developing professional competence and helps individuals develop the knowledge, judgment, and skills required for their roles. Further, this doctrine requires commanders to develop trust in their subordinates to execute actions at the lowest possible decision-making authority. This doctrine suggests that all Soldiers require critical thinking skills to assess situations, apply judgment, and execute with skill in any environment (Department of the Army [ADP 6-0], 2019).

Leadership doctrine states that education is critical for developing leaders who can make informed decisions, adapt to complex situations, and lead effectively (Department of the Army [ADP 6-22], 2019). Further, education provides leaders with the knowledge and critical thinking skills necessary for effective leadership (Department of the Army, [FM 6-22], 2019).

The Army defines education as a "structured process aimed at imparting knowledge through teaching and learning, primarily within the Institutional and Self Development Training Domains" (p. 2). The goal is to enhance an individual's ability to perform in unknown situations by increasing their knowledge, skills, and experience. Education differs from training, which focuses on specific tasks and performance standards (Department of the Army [AR 350-1], 2017). The Army funds some institutional education required to meet operational needs and encourages Soldiers to seek advanced education for self-development consistent with their Army technical specialty. Other regulations and publications authorize educational opportunities that Soldiers may utilize for advanced education.

> Education is crucial for subordinate leaders. Education enhances tactical and technical competence, which is foundational for effective mission command. Education, along with training, assignment experience, and professional development, helps subordinates achieve the competence needed to perform assigned tasks to standard. Competence directly influences the level of trust commanders have in their subordinates' ability to execute mission orders in a decentralized manner while managing acceptable levels of risk (Department of the Army [ADP-6-0], 2019).

The Cognitive Hierarchy

Every Army educator and trainer understands Bloom's Taxonomy and the cognitive hierarchy. The lower tiers of each relate to training and resemble junior Soldier and junior officer development in the Army. Training events support learning the application of individual and collective tasks at the tactical level. For example, a new Soldier will learn to remember facts, terms, and simple procedures through repetition and performance evaluations like drill and ceremony, rifle marksmanship, and basic first aid tasks. Soldiers will then learn to understand instructions to perform more complicated tasks until they can demonstrate the capability to apply those instructions in simulated operational conditions under stress. Even with years of technical experience, an educated junior officer must still demonstrate proficiency at the application level of the cognitive hierarchy. It is important to note that decision-making at the application level is binary at best when higher thought processes are not available or not applied.

Critical thinking is defined as examining a problem in depth from multiple perspectives to determine if conclusions are justified based on given inferences or arguments. Creative thinking involves thinking in new, innovative ways using imagination, insight, and different ideas to address unfamiliar or evolving problems (Department of the Army [ADP-6-0], 2019).

An educated subordinate leader can recognize problems, think through potential solutions, and apply judgment to execute disciplined decision-making and decentralized execution consistent with the commander's intent. Mission command doctrine defines this ideal in the nine principles of Mission Command: competence, mutual trust, shared understanding, commander's intent, mission orders, disciplined initiative, and risk acceptance (Department of the Army [ADP 6.0], 2019).

The History of Army Education

Does the Army recognize education as valuable to subordinate leaders who are not in leadership positions?

The Army institutional training domain uses a model designed to solve training gaps to create Professional Military Education. The instructional design model for education and training is called ADDIE—the acronym for a set of processes performed to build training courses. This model was created for the Army by Florida State University in the early 1970's to standardize training development. This model coincides with the Training and Doctrine Command (TRADOC) creation. The digital system of record for documenting and sharing these training courses is called the Training Development Capability, and training developers build training courses. The courses are forced to fit within a system that is designed for the bottom three tiers of the cognitive hierarchy. Furthermore, Army courses are funded and staffed with training dollars that are prioritized less than operations and maintenance of the Force (Department of the Army [AR 350-1], 2017).

In 1802, Congress created the United States Military Academy at West Point to be the commissioning source for Regular Army officers (Crane et al., 2019). Many officers during the American Revolution and subsequent campaigns were led by state-appointed officers. During World War I, Congress authorized the Reserve Officer Training Corps and the Officer Reserve Corps in the National Defense Act of 1916 to modernize and expand the pool of officers to meet war demands (Crane et al., 2019). Arguably, the Army has maintained its historic delineation between the educated officer and the "uneducated" subordinate by institutionally requiring entry education and providing advanced education for officers. If time and funding allow, the Army offers volunteer civil education programs for enlisted and warrant officers.

Outside of West Point, the Command and General Staff College and the Army War College are just a few technical branches that award educational degrees (law, medicine, logistics). The American Council for Education certifies some courses and lessons taught as eligible for college credit. However, the accreditation of those courses is secondary to the design of those courses created with training processes.

The Army and the world in which it operates have drastically changed since the days of the "hollow" Army of the post-Vietnam and early all-volunteer force. "The Nation needs servicemembers who are both educated and trained. The way military force is used these days in highly charged and complex 'peacetime' politico-military environments clearly requires more than a military man or woman narrowly attuned to a combat task" (Kime, 1997). The Air Land Battle operations doctrine developed in the 1980s by TRADOC

required organizations to train as they fight in highly task-based individual and common task-evaluated exercises. After the start of the Global War on terrorism, the doctrine was modified to train for full-spectrum operations that included counterinsurgencies, technology, and joint planning and warfighting below the strategic level. In 2019, unified operations doctrine in multi-domain environments, with a view toward large-scale combat operations, came with the end of significant counterinsurgency operations in the Middle East. Peer and near-peer threats and sophisticated non-state actors instigating complex geo-political cyber and space domain provocations in and around our homeland are forcing a high degree of rapid problem-solving dilemmas that require the force to think and fight. To this end, can the Army train Soldiers to think?

Application of Design Thinking

Design thinking is a relatively new concept to the Army. The design concept was formally introduced by TRADOC Pamphlet 525-5-500 in 2008 and, more broadly, in 2010 with Field Manual 5-0. While the Army has adopted the design concept, it has yet to truly acculturate design thinking outside of the officers who study Army Design Methodology (ADM) for operational planning and the few knowledge managers who apply ADM in problem-solving at the echelons above the brigade. Some branches have adopted Knowledge Management practices but are unlikely to use ADM for more than battle rhythm and content management applications.

Soldiers and junior officers are trained in the step-by-step Military Decision-Making Process (MDMP). When driven by experienced planners and wise commanders, the MDMP and its sub-processes can deliver excellent operational orders. Mission command principles tell us that the commander's intent is the desired end state and give flexibility for disciplined initiative as the operating environment variables change. This requires a design-informed mindset to be effective at all echelons, grades, and specialties.

“Army design methodology is particularly useful as an aid to conceptual planning but must be integrated with the detailed planning typically associated with the MDMP to produce executable plans” (CALL, 2015, p. 3). The authors of Handbook 15-06 (MDMP) realized that before analysis, synthesis, and perhaps even evaluation/creation must occur to prevent the “lack [of] the fidelity necessary to provide the commander with decision-making information” (CALL, 2015, p. iii). These cognitive skills result from diverse education and experiential adult learning environments that generate high-order thinking rather than standardized task-based training.

Numerous historical examples of cognitive deficits resulting in poor operational performance can be used to demonstrate failures in analytics and end-state design. For

example, the battle of Somme in 1916 resulted in over a million casualties due to a lack of deep understanding of tactics and operational awareness on the ground. More recent operational examples may be found in the analysis of Anaconda in 2002, Fallujah in 2004, Mosh Tarak in 2010, and Operation Odyssey Dawn in 2011. While these operations were planned at echelons well above brigade, the idea that the more all Soldiers are versed in design, the better planning will be at all echelons, even echelons above "reality," seems logical and is supported by operational doctrine. Education needs to be supported in application, policy, or resourcing, even within operational planning and preparation for large-scale combat operations.

> Servicemembers in today's military forces are often called upon to engage in operations requiring considerable discretion and careful orchestration… the Services do promise postsecondary educational opportunities in order to attract the college-capable recruits they need. This promise is only meaningful if the recruit has a legitimate opportunity to advance beyond military training to college-level coursework and degree programs. If the promise is not honored, the Services will fail to develop the kind of servicemembers needed today, and the ability to recruit the people needed to operate a modern military establishment in the future will suffer. This is a major strategic issue. (Kime, 1997).

Framing

Army Design Methodology refers to framing an operational environment that “involves critical and creative thinking by a group to build models that represent the current conditions of the operational environment (current state) and models that represent what the operational environment should look like at the conclusion of an operation (desired end state)” (Department of the Army [ATP 5-01.1], 2015). Cognitive framing or “lensing” expands beyond the operational environment and into everyday decision making by applying one's understanding of information “lensed” by their cognitive biases, previous experiences, and current context. Many lenses must filter a Soldier's everyday decision-making. These lenses include the Army values, the Warrior Ethos, the characteristics of the Army profession, the commander's intent, personal values and ethics, and individual wisdom. To further complicate cognition, organizational and generational communication dynamics can impact shared understanding, commander’s intent, and inclusive organizational problem-solving activities beyond operational planning. Time and other resourcing constraints can lend credence to using operational models like MDMP and Troop Leading Procedures to solve problems without the cognitive work required to

analyze the current state and design a path toward the desired end state considering all systematic variables.

> …commanders examine the differences between the natural tendency of an operational environment and desired future states of relevant actors with the desired end state. These differences are tensions (frictions, conflicts, and competitions) between relevant actors including geographic, demographic, economic, religious, and resource consumption trends. Combined, these tensions represent a set of interrelated problems (a system of problems) requiring resolution (Department of the Army [ATP 5-01.1], 2015, p. 1-4).

End State

“Dialogue is the catalyst that drives planning teams to develop new ways of thinking about problems and identify innovative solutions” (Department of the Army [ATP 5-01.1, 2015. p. 1-4). Regardless of the problem, echelon, or environment, the Army needs all Soldiers to apply cognitive problem-solving skills surpassing the training capacity of antiquated task-based systems (people, processes, tools, and technologies) designed from compliance-oriented training approaches.

Soldiers must be able and committed to thinking to win the battles of the not-so-distant future. Our people-centric Army must change our systems to educate Soldiers and prioritize education in our culture. Talent Management is a step in the right direction. Using language that promotes education is also essential to lead organizational change. The language that people and organizations use reflects their values. Educated leaders who do not support education in their followers may be counterproductive in their ability to lead organizations that can plan, perform, and win.

Conclusion

The American Soldiers never back down—they always place the mission first. They never quit or accept defeat. They are experts and professionals. They are very well trained and stand ready to deploy, engage, and destroy the enemy. There is no doubt about this.

Our next fights are in operating environments “unknown and unknowable” (Department of the Army [ADP 5-0], 2015). We tell our Soldiers to use mental agility, critical and creative thinking, innovation, and systems thinking. We train them on a few processes to demonstrate these high-thinking skills (Department of the Army [FM 6-22], 2022). However, the Army relies on the self-development domain. Our founding fathers preferred civil education to complement military training and discipline (Crane et al., 2019).

However, leaders often do not support self-development or abuse those who display higher capacity thinking and performance by failing to develop those who do not. Finally, the Army uses antiquated systems and language that force education into a training context, minimizing the ability of educators at levels below Field Grade Professional Military Education to teach without a “band-aid" or systematic approach to reaching high-thought context. Imagine organizations using ADM as a natural precursor to any process that requires an authority at battalion echelons and above. Soldiers would naturally have awareness and shared operation or organizational understanding, assess the current state, collaborate diversely with analytical research in context, and develop systematic solutions consistent with commanders’ intent, the Army values and ethics, and in support of the Army Profession.

The Army is incredibly resilient. Instructors get it done with the ADM-based band-aid approach and the deprioritized resources that trickle to the institutional Army’s training base. The Army should discuss if our training is enough. The Army should courageously develop Soldiers with systematic education. If you ask any instructor in the Army what keeps them up at night, it might be, "Are we doing enough, and can we sustain ourselves in this environment given what is next?”

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