Design and Operational Art

A Practical Approach to Teaching the Army Design Methodology

Colonel Thomas Graves, U.S. Army and
Bruce E. Stanley, Ph.D. U.S. Army, Retired

OVER THE PAST five years, the Army has annually updated its doctrine to reflect the evolution of its understanding of the Army design methodology. As the Army design doctrine has evolved, so has the design curriculum at the U.S. Army's School of Advanced Military Studies (SAMS). In an effort to maintain relevance with the operational army and joint force, the SAMS faculty adjusted its design and operational art curriculum based on feedback from commanders and senior Army leaders. Thus, the updated curriculum increases the student officers' understanding of Army design methodology and improves communication between graduates and their commanders. Previous versions of the SAMS design curriculum did not acknowledge the past application of critical and creative thinking from military practitioners. Instead, the design curriculum relied on theory and concepts from a variety of design disciplines, resulting in a heavy reliance on metaphor to reach understanding about design.

This article describes the current SAMS design curriculum, highlights its relationship to the broader SAMS curriculum, and demonstrates a practical way to teach Army design methodology.

COL Thomas Graves is the director of the School for Advanced Military Studies (SAMS), Fort Leavenworth, KS.

Bruce E. Stanley is an assistant professor at SAMS. He holds a Ph.D. from Kansas State University.

COL Pat White, Deputy Commander of TRADOC's Combined Arms Center-Training, discusses ideas for revitalizing U.S. Army training in 2015 and beyond with School of Advanced Military Studies (SAMS) students, Fort Leavenworth, KS, 29 August 2011. (U.S. Army)

Mission and Development

The mission of SAMS focuses on educating members of our Armed Forces, our allies, and the interagency at the graduate level to be "agile and adaptive leaders" who are critical and creative thinkers, people who produce viable options to solve operational and strategic problems. The SAMS goal is to develop effective operational planners who are good leaders and great teammates. The Advanced Military Studies Program has eight graduate outcomes. First, the graduate is grounded in operational theory, doctrine, and history. Second, the graduate is a "critical and creative thinker" who can identify problems and propose viable solutions. Third, the graduate can

clearly communicate recommendations verbally, graphically, and in writing. Fourth, the graduate has a firm understanding of peer leadership and team building. Fifth, the graduate has the courage to lead from above, beside, and below. Sixth, the graduate is physically and mentally tough. Seventh, the graduate can collaborate effectively to get the job done. Finally, the graduate "does not care who gets the credit."

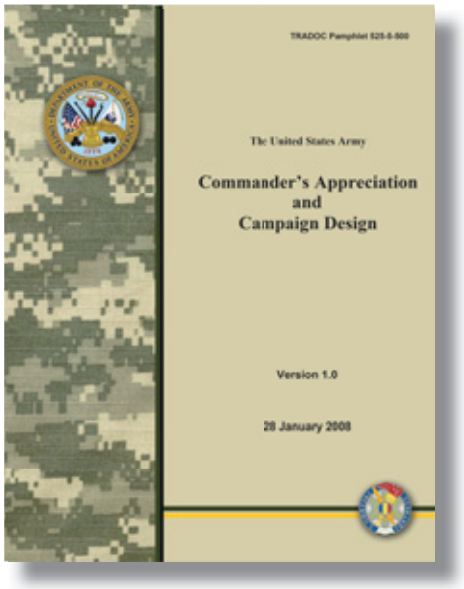
The development of the SAMS design curriculum can be categorized into three time periods: the curriculum predesign doctrine, the curriculum during the development of the design doctrine, and the curriculum post-design doctrine. Prior to the development of the design doctrine, SAMS introduced the concepts of design in its curriculum. In January 2008, the U.S. Army Capabilities Integration Center published Training and Doctrine Command (TRADOC) Pamphlet 525-5-500, *Commander's Appreciation and Campaign Design* (CACD). The planning methods proposed in the pamphlet followed three years of Army level seminars and wargames to increase operational and strategic thinking.

Just prior to CACD's publication, the TRADOC commander directed that the planning methods proposed in CACD be implemented at the School of Advanced Military Studies beginning in June 2007. TRADOC proposed four goals for SAMS. First, improve the existing doctrinal operational design approach by improving the Army understanding of complex problems and the environment. Second, develop critical and creative thinkers and adaptive leaders. Third, refine and continue to develop CACD methods through course iteration and provide input to the Army for doctrinal institutionalization. Fourth, produce graduates who have mastery in the CACD methods. The SAMS leadership and faculty approached the TRADOC tasking by developing a pilot course that focused on design and drafting a design student text during the 2008 academic year.

Design

In 2009, the concept of design made its first appearance in Army doctrine with the publication of Army Field Manual-Interim (FMI) 5-2, *Design* (Draft). This began a three year effort to incorporate the Army design methodology into Army doctrine. The stated purpose of FMI 5-2, *Design,* was to provide a comprehensive account of design doctrine and institutionalize an approach to reasoning and critical thinking. By academic year 2009, SAMS incorporated a 24-lesson design course into its 11-month curriculum. The design course relied on a variety of theories, concepts, and models to learn about design. Though not an exhaustive list, some of these included systemic operational design theory, chaos and complexity theory, systems theory, and organizational theory. Additionally, concepts of narrative and discourse, culture, and for a short time, even the field of architecture design was used in the curriculum.

By March 2010, TRADOC introduced Field Manual (FM) 5-0, *The Operations Process,* which superseded FMI 5-2. The TRADOC commander pointed out that the intent of FM 5-0, *The Operations Process,* was to encourage greater flexibility through critical thought, action, and initiative. Three ideas were central to the new doctrine. First, the new doctrine introduced design. Second, the doctrine expanded the discussion of full spectrum operations. Third, the new doctrine reinforced the central role of commanders. Twelve months later, FM 5-0, *The Operations Process,* was updated once again with change 1 to account for new doctrine established in the Army's *Operations* manual, FM 3-0.



Training and Doctrine Command Pamphlet 525-5-500, *Commander's Appreciation and Campaign Design*.

In March 2012, TRADOC released a series of doctrinal updates that include Army Doctrinal Publication (ADP) 5-0, *The Operations Process,* and Army Doctrinal Reference Publication (ADRP) 5-0, *The Operations Process*. Together, these two manuals provided an expanded discussion of planning, preparing, executing, and assessing operations. The updated manuals established a common frame of reference and the language for commanders and staffs to exercise mission command. The manual also replaced the term "design," with the new doctrinal term "Army design methodology." Additionally, the definition of Army design methodology was again updated, although many of the original concepts introduced in the 2009 FMI were retained in the chapter focused on planning, chapter 2.

In addition to the published doctrine on design, other design publications emerged. In 2009, Dr. Jack Kem published *Design: Tools of the Trade* to link design to the 2008 version of FM 3-0, *Operations,* manual and the ideas concerning battle command. SAMS published the Design Student Text, version 2.0 in the spring of 2010 to supplement the design curriculum. By October 2011, the Joint Staff J-7 released the *Planner's Handbook for Operational Design* to describe design ideas in the context of joint doctrine, specifically operational design and the joint operational planning process. Spring 2012 saw the Army Research Institutes publication of *Army Design Methodology Commander's Resource,* which sought to bridge the gap between design theory and the application of the Army design methodology in the field. These are just the official publications; a myriad of articles, monographs, and blogs have proliferated on the Internet. The short time frame during which official publications and academic writing about design proliferated only served to further obfuscate core design principles and convoluted discussion.

Curriculum Changes

With the publication of FM 5-0 and ADP/APRP 5-0, SAMS refined its curriculum for academic years 2011, 2012, and 2013, fully implementing TRADOC's directive. Based on feedback from the operational Army, many of the concepts were retained in the SAMS design course while others were discarded as the curriculum was refined. Since much of the existing design theory was based on a variety of fields of study such as architectural design, product design, process design, or engineering design (to name a few) they only served as a metaphor for student understanding. The addition of military history improved the SAMS students' understanding by placing the key components of design in their proper context of what military commanders and organizations do: solve military problems. Placing design within a military context had the additional benefit of increasing understanding among military practitioners and improved communication between the graduate and the operational commander.

In 2012, the refinement of the SAMS curriculum resulted in the yet another update to the design course. The Design and Operational Art course incorporated many of the ideas, concepts, theories, models, and practices of the previous seven years. Thus, the current SAMS design course teaches student officers to evaluate unfamiliar and complex problems. Three additional course elements enable student officers to achieve the course objective: analyze and explain the current operational environment; analyze, develop, and explain the military problem; and analyze and develop a new operational approach to solve a military problem. The objectives of the Design and Operational Art course link directly to the Advanced Military Studies mission: graduate agile and adaptive leaders who are critical and creative thinkers who produce viable options to solve operational and strategic problems. Furthermore, the Design and Operational Art course supports the graduate outcomes by providing grounding in operational theory, doctrine, and history; developing clear communication skills; improve understanding of peer leadership and team building; and developing the ability to collaborate effectively to get the job done.

Based on feedback from the operational Army, many of the concepts were retained in the SAMS design course while others were discarded as the curriculum was refined.

(Noah Albro, Command and General Staff College PAO)

Students at the School of Advanced Military Studies participate in a classroom activity, Fort Leavenworth, KS, 2 November 2010.

The Design and Operational Art course is typically the fourth of five courses within the academic year. The three courses that precede the Design and Operational Art course are Theory of Operational Art, Evolution of Operational Art, and Strategic Context of Operational Art. The Future of Operational Art course follows the design course. The courses that precede the design course provide the student officers with a theoretical, historical, and practical context necessary to establish the utility of the Army design methodology within a military context.

The Design and Operational Art course is six weeks long, with 18 lessons. Typically, there are three lessons per week that average about three hours in length. All of the lessons are in a seminar setting co-taught by a military officer (former battalion commander) and a civilian faculty member (Ph.D.). Following the classroom lessons is a two-week practical exercise, in which the student officers apply the course material to an unfamiliar military situation. The lessons devoted to the Design and Operational Art course are comparable in length to the other four courses in SAMS.

The course is presented in five modules. The first module is an introduction to design methodology. The second module focuses on analyzing and explaining the operational environment. The third module introduces how to analyze, develop, and explain an operational military problem. The fourth module examines how to analyze, develop, and explain an operational approach. The fifth module focuses on practicing how to use the Army design methodology. As previously mentioned, a two-week practical exercise follows the seminar course work. The course material used during the lessons consist of Army and joint planning doctrine; ideas, concepts, and models from a variety of academic disciplines; military historical examples; and practical application. Military doctrine provides a foundation and start point for the discussion of the Army design methodology.

The ideas, concepts, and models supplement military doctrine and provide the student officers with additional problem solving tools. The military historical examples illustrate how previous military commanders and military organizations have addressed unfamiliar and complex situations. Additionally, the historical cases arm the student officer with practical military examples to illustrate how the key concepts of the Army design methodology can be used within a military context. The goal of this approach is to improve the SAMS graduate ability to communicate with operational commanders. The practical exercises that are incorporated into the courseware enable the student officer to use the ideas, concepts, and models to enhance their understanding of how they can apply them to military planning.

The first module consists of three lessons that examine the current Army doctrine on planning and the Army design methodology. Secondary readings provide the student officers with the context in which the Army design methodology evolved following its introduction in 2005, how the Army design methodology fits into Army planning, and how the design and operational art are used as part of Army planning. Underpinning the introductory module is a military historical case—T.E. Lawrence in World War I—that illustrates some of the key concepts of the Army design methodology.[1] The student officer is introduced to the concept of "applied practitioner" as a reminder that the outcomes of their planning results in action, most often involving the lives of others. Several models are introduced to help the student officers understand how to develop a better understanding of the operational environment and the problems associated with unfamiliar problems.[2] These models supplement the existing tools and models in current Army and Joint doctrine.[3]

The module concludes with a lesson on what strategic leaders do, based on current Army leadership doctrine. Additionally, student officers are provided with theoretical tools that can assist them as future planners working in large organizations.[4] For many of the SAMS graduates this will be the first time they have served at headquarters above the battalion and brigade level. Throughout the week, the students are challenged to apply the doctrine and concepts to assess the T.E. Lawrence case study, providing them with the first of seven opportunities to practice the Army design methodology.

The second module also consists of three lessons that focus on analyzing and explaining the operational environment. Once again, a military historical case—Prussia 1806 to 1813—is used as a guide to illustrate how a military leader developed an understanding of the operational environment and developed a narrative that guided change in military organization.[5] The majority of the modules' readings focus on how a well-constructed narrative helps explain an unfamiliar or complex situation.[6] Although the models and tools for analyzing an operational environment are familiar and useful for most military planners, the emphasis on narrative development enhances the SAMS graduates' ability to communicate effectively with operational commanders. Like the first module, the students are challenged with applying the concepts and ideas to the military historical case, specifically their ability to analyze and explain the operational environment.

The third module consists of four lessons that emphasize how to analyze, develop, and explain an operational military problem. Two historical cases are used to illustrate military organizations that failed to understand the operational problem. The first historical case is the Allied search for the V1

SAMS graduation class 12-01 with speaker MG Anthony Cucolo, 17 May 2012, (CGSC PAO)

and V2 rockets during World War II.[7] The second historical case is the United Nations military intervention during the siege of Sarajevo, Bosnia, in the early 1990s.[8] Several secondary sources provide complementary ideas about how to understand complexity and military failures.[9] Together, the ideas presented provide the student officers with conceptual models to better understand and anticipate military problems. Student officers use the military historical cases to continue their practice of applying the Army design methodology, specifically their ability to analyze, develop, and explain an operational military problem.

The fourth module is composed of three lessons that examine how to analyze, develop, and explain a new operational approach. Using Field Marshall William Slims' experience as a Corps and Army level commander in Burma from 1942 to 1945 illustrates how an operational commander creates a new operational approach to solve a difficult military problem.[10] The module links the Army design methodology to operational art, specifically with focused study of the elements of operational design, center of gravity, and center of gravity analysis. The military historical case allows student officers to examine how Slim created a new operational approach based on his understanding of the operational environment. More specifically, the historical cases highlights how Slim created a new narrative to help him explain not only the problem, but also how he intended to implement his new operational approach. Throughout this module, student officers are challenged to apply the Army design methodology to the military historical case.

The final module covers two weeks and consists of five lessons that allow the student officers to practice using the Army design methodology. Once again, two military historical cases are used to illustrate the key concepts of the Army design methodology. The first historical case is the U.S. Army's transition to the all-volunteer force between 1968 and 1973.[11] The second historical case is General Abrams in Vietnam between 1968 and 1971.[12] Both cases illustrate how a military organization or military commander changed operational approach based on a change in the strategic context. Secondary readings complement the case studies by introducing the student officers to some ideas and concepts about critical and creative thinking, complex adaptive systems, chaos theory, and systems theory.[13] Student officers apply all of the course material to analyzing and explaining the operational environment; analyzing, developing, and explaining an operational military problem; and developing and explaining a new operational approach within the two historical cases.

Practical Application

A two-week exercise follows the eight weeks of coursework. The practical exercise introduces student officers to an unfamiliar and complex situation. The students are placed into military organizations and positions that require them to analyze and explain the operational environment; analyze, develop, and explain an operational military problem; and develop and explain a new operational approach. Exercises rely on a variety of scenarios, most place the students within a joint task force headquarters or a combatant command. Often the practical exercise includes scenario injects that are a catalyst for reframing. The goal of the practical exercise is to allow the student officers to apply the doctrine, theory, models, and concepts from the courseware to creating a new operational approach.

As the Army design doctrine evolved, so has the SAMS design curriculum. To remain consistent with current Army doctrine, the SAMS design curriculum has been adjusted in an effort to remain relevant with the operational army, improve the student officers' understanding of the Army design methodology, and improve communication between the SAMS graduate and the operational commander. Although some of the course material introduced between 2008 and 2010 remains, the addition of the historical cases provides a military example to illustrate the key concepts of the Army design methodology. The recent update to Army doctrine enabled the updates to the SAMS design curriculum to align with the concepts of Unified Land Operations and integrated planning. As the Army and joint community receive feedback from the operational force and continue to learn about design, SAMS will continue to evolve its design curriculum to serve the operational commander better. ***MR***

NOTES

1. T.E. Lawrence, *Seven Pillars of Wisdom* (London: Penguin, 1926, 1962). Lawrence Moores, "T.E. Lawrence: Theorist and Campaign Planner," School of Advanced Military Studies, U.S. Army Command and General Staff College, 1992.
2. Bryan Lawson, *How Designers Think: The Design Process Demystified*, Fourth Edition (New York: Architectural Press, 1980, 2007). Donald A. Schoen, *Educating the Reflective Practitioner* (San Francisco: Jossey-Bass, 1987).
3. Army Doctrine Publication (ADP) 5-0, *The Operations Process* (Washington, DC: U.S. Government Printing Office [GPO], May 2012). Army Doctrine Reference Publication (ADRP) 5-0, *The Operations Process* (Washington, DC: GPO, May 2012).
4. ADP 6-0, *Mission Command*, May 2012. ADRP 6-0, *Mission Command*, May 2012. U.S. Army Field Manual 6-22, *Army Leadership* (Washington, DC: GPO, October 2008). John P. Kotter, *Power and Influence* (New York: The Free Press,1985).
5. Peter Paret, *The Cognitive Challenge of War, Prussia 1906* (Princeton: Princeton University Press, 2009).
6. Porter Abbot, *The Cambridge Introduction to Narrative* (New York: Cambridge University Press, 2002).
7. John Keegan, *Intelligence in War* (New York: Random House, 2002).
8. Peter Andreas, *Blue Helmets and Black Markets: The Business of Survival in the Siege of Sarajevo*, First Edition (Ithaca: Cornell University Press, 2008).
9. E.A. Cohen, and J. Gooch, *Military Misfortunes: The Anatomy of Failure in War* (New York: Free Press, 1991). D. Dörner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (New York: Basic Books, 1996).
10. Field Marshal Viscount Slim, *Defeat into Victory* (New York: Macmillan.1987).
11. Robert K. Griffith, *The US Army Transition to the All Volunteer Force 1968-1974* (Washington, DC: Center for Military History, U.S. Army, 1997).
12. Lewis Sorley, *A Better War* (Orlando: Harcourt Books,1999).
13. Y. Bar-Yam, *Making Things Work: Solving Complex Problems in a Complex World* (Cambridge: New England Complex Systems Institute Knowledge Press, 2004). Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Architecture*, 2nd Edition (New York: Elsevier, 2006). COL Stephen J. Gerras, "Thinking Critically about Critical Thinking: A Fundamental Guide for Strategic Leaders," *U.S. Army War College*, June 2008.