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Chapter Six

Make It Stick

Institutionalizing Wargaming at EDCOM

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INTRODUCTION

In 2019, General David H. Berger’s Commandant’s Planning Guidance (CPG) threw down the gauntlet on using wargaming to “fill the greatest deficiency in the training and education of our leaders: practice in decision making against a thinking enemy.” Anything the Commandant calls “the greatest deficiency” deserves immediate and aggressive correction; and so, Education Command (EDCOM) and Marine Corps University (MCU) considered how to execute the unambiguous marching order. MCU gathered individuals from the resident schools, the Brute Krulak Center for Innovation and Future Warfare, and the operations, business affairs, and academic affairs offices into a working group to develop a “Wargaming Master Plan” to guide MCU’s efforts during the next five years to integrate wargaming as an educational tool across professional military education (PME) curricula.

So, there is plenty of churn behind the term wargaming in

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1 This article was adapted from material previously published in the June 2021 issue of the Marine Corps Gazette, and the authors are grateful for the permission of the Gazette editorial board and Marine Corps Association and Foundation to present that material here.


the agencies of training and education. Yet, long-time observers of the Marine Corps know this is not the institution’s first experience with the wargaming world, and might fairly wonder: Is this more heat than light? A trail of Marine Corps Gazette articles go back for decades, highlighting the value of wargames as inexpensive yet invaluable tools for filling that same decision-making deficiency. The Corps’ effort to integrate them into training or education was haphazard at best. In the early 1980s, it looked like the Corps might have turned the corner—at least in the training realm—with the development of the TACWAR game system, with a grand vision of giving TACWAR to every rifle company in the Fleet Marine Force (FMF). Only a decade later, TACWAR suffered the usual fate of one-size-fits-all systems: “neglected at all levels . . . stacked like cordwood in warehouses . . . [and] bogged down in its own procedures . . . [as to be] so muddled with administrative minutiae that players soon become bored and their initial enthusiasm is lost.”

When General Charles C. Krulak became Commandant in 1995, he tried to swing the pendulum back the other way by exploiting the proliferation of personal computers to help simplify and automate the adjudication of that “minutiae” in wargames. He signed Marine Corps Order (MCO) 1500.55: Military Thinking and Decision Making Exercises, authorizing the use of government computers for playing approved software wargames and mandating that Marines participate in decision-

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6 Capt Stuart W. Bracken, “Modifying TacWar for the Lean Times Ahead,” Marine Corps Gazette 76, no. 10 (October 1992): 44.
making exercises “daily.” General Krulak’s tenure saw the development of an add-on to the popular first-person shooter computer game *Doom*, done in-house by a single energetic sergeant. *Marine Doom* was the manifestation of Krulak’s own CPG directive to make “our education and training processes and institutions technologically innovative, challenging and fun . . . [to] help us derive imaginative solutions to the challenges we face.” Interestingly, *MCO 1500.55* is still a “current” order—yet, there are likely few Marines today who could look at themselves in the mirror and say they engage in challenging decision-making activities daily with their own Marines; and heaven help the Marine who tries to install a commercial wargame on their government computer.

So, the Marine Corps’ historical relationship with wargaming as a tool for training and education begs the question: How will this time be any different? As we approach the two-year anniversary of General Berger issuing his CPG, there is still a long road ahead for the institutionalization of wargaming across the entire Corps, but we would like to offer the model pursued at EDCOM in developing and executing its *Wargaming Master Plan* as a possible way forward. This model, driven by the aggressive mandate laid down in the CPG, and building off decades of painful failure and tepid success, fuses the things that worked in preceding years with the freedom to abandon the things that failed. It recognizes that answering the question of “how do we institutionalize X?” requires the use of an *institution* on which to ground the effort. This gives the project resources, manpower, and the backstop of authority to direct the work and make it take root. Ideally, whichever institution provides that foundation also contains a mechanism that max-

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imizes prospects for the project to grow and spread its impact beyond its own walls to the wider target audience. EDCOM is a logical foundational institution for this task, as its schools provide recurring touchpoints with Fleet Marine officers and enlisted leaders. These Marines get exposed to the possibilities and applications of wargaming in their curricula, and then return to the FMF where they can then help drive the institutionalization beyond the confines of the foundational organization.

EDCOM’s model also abandons the “one game to rule them all” mentality and embraces what should be three uncontroversial themes: different levels of PME require different games to support their learning objectives; wargame content and execution does not need to be hopelessly complex to be useful; and that, as in the case of Marine Doom, the greatest promise comes from leveraging talent already extant in the Marine Corps. This chapter will provide several case studies of how EDCOM has woven these concepts together in executing its master plan, and hopefully provide some grist for the mental mills of other entities and commands seeking to tackle that “greatest deficiency” in their own ways.

ACHIEVING CRITICAL MASS

Wargaming at the College of Enlisted Military Education

By sheer weight of numbers, the best way to rectify the deficiency identified by General Berger would be plugging wargaming into enlisted training and education. Enlisted Marines make up the vast majority of the Corps’ manpower structure, and so using wargaming as a tool in enlisted PME would, simply by quantity, provide a quality impact all of its own. Yet paradoxically, the opportunity in enlisted PME for achieving a decisive effect with wargaming also faces the greatest challenge, as enlisted courses are structured differently than officer PME, particularly in the number of classroom hours available to students. Officer PME is measured in months, and enlisted PME in weeks, leaving little wiggle room for adding new requirements like wargames,
especially those which take place across several days or even weeks. Despite the obvious potential gain, execution would be a difficult needle to thread.

Gunnery Sergeant Dathan Byrd was willing to thread that needle. A curriculum developer and adjunct faculty at the College of Enlisted Military Education (CEME), he had begun his tenure there by revitalizing the Small Unit Leadership Evaluation (SULE) module taught at the Sergeant’s Course, and taking the new SULE on the road to oversee implementation at the many enlisted academies spread across the FMF. As part of the effort to revamp the SULE, Gunnery Sergeant Byrd realized that enlisted courses as a whole needed a fresh look at how they pursued their learning objectives.

The problem was multifaceted. Warfighting, Marine Corps Doctrinal Publication 1 (MCDP 1), and the philosophy of conflict therein was the core of each enlisted program. But “warfighting” was often conflated with “warfighting functions,” standardized in five-paragraph orders and exercises in the Marine Corps Planning Process (MCPP). Moreover, there was little opportunity for practicing the essence of Warfighting, which was confronting a thinking human adversary and putting them on the horns of a dilemma with which they could not cope. To act as effective advisors to their commanders and other decision makers, enlisted Marines needed to speak the same doctrinal language as those officers who were immersed in Warfighting and other doctrinal concepts from the very beginning of their careers.

Beyond that, enlisted leaders also had to be effective de-

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10 The following is taken from correspondence and informal conversations with Maj Brown, as well as the detailed background on GySgt Byrd’s work with wargaming at CEME found at “Introduction to a Wargame Seminar (Nov. 2019),” YouTube video, 6 January 2020, 1:35:31 min.; and “Controversy and Clarity podcast season 2, #3, Dathan Byrd,” Spotify, posted 12 January 2021.

cision makers in their own right, able to intuitively and rapidly translate their broad base of experience into action under pressure and against human opponents who were doing their best to counter those actions. Yet, there were few opportunities to actually develop and practice this decision-making habit in existing CEME courses. Students got exposure to tactical decision games (TDGs), which was good but incomplete, as a TDG’s white board did not “fight back” or offer open-ended decision-making paths. Dynamic problems and adaptive adversaries filled the worlds of deployment and combat; Marines needed to enter those worlds with decision-making habits practiced and honed in the educational courses intended to prepare them for those challenges.

Looming over these considerations was the issue of time: time to practice decision making and doctrinal application within the course, maximizing the “reps and sets” executed in a short window of time, and not burdening the individual CEME courses with additional class time that simply was not available. TDGs offered an advantage here because they were not time intensive, but again neither were they robust enough to meet all the required learning objectives. Gunnery Sergeant Byrd examined the historical PME approaches taken by other militaries when providing their enlisted leaders opportunities for doctrinal mastery and decision making. He found one idea repeated in these old documents, whether written by German, French, Israeli, or other militaries: wargaming. Focusing his attention on this theme, further research showed Byrd that many past Marine Corps leaders like Generals Alfred M. Gray, Charles Krulak, and Paul K. Van Riper had all spoken of wargaming’s value as an educational tool, though institutionalizing it had proved an enduring challenge. Regardless, the historical evidence supporting wargaming’s utility seemed clear, and when it was released in summer 2019, General Berger’s CPG laid out an obvious expectation for wargaming execution. Gunnery Sergeant Byrd drafted and received approval for a plan that, starting with the Career School, would use wargames to teach
doctrine and decision making without adding a new burden to the course’s short seven-week curriculum.¹²

The question now turned to what type of wargame could support the career course’s learning objectives within the time constraints. Additional research led Gunnery Sergeant Byrd to a “matrix” wargame as the ideal solution. Like other types of wargames, matrix wargames included a synthetic environment—a map, tabletop game board, or some other playing space—and units or assets that players used to execute their decisions. But matrix games also had less-rigid rule sets, which made them easier for facilitators to teach and students to learn, and required less time to adjudicate the results of player decisions.¹³ Through the Connections-Oz civilian-run wargaming community, Byrd found a matrix game that, with some adaptation, suited CEME’s needs. John Curry and Tim Price from the Connections-Oz United Kingdom branch had created a matrix game focused on the fictional Afghan village of Lasgah Pol.¹⁴ The game supports up to six players, each one representing a different faction seeking to influence the civilian population in order to achieve their own objectives. With Curry and Price’s permission, Gunnery Sergeant Byrd adapted some of the materials to American tables of organization and equipment and then put it in front of his students.

Both students and faculty rapidly gravitated to the game. Here, in a synthetic environment that could be set up or torn down in a matter of minutes, and not requiring expensive hardware or an army of facilitators, enlisted leaders could do a practical application of tasks to execute operationally from

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¹² Byrd communication with authors; “Introduction to a Wargame Seminar (Nov. 2019)”; and “Controversy and Clarity podcast season 2, #3, Dathan Byrd.”

¹³ See, for example, Rex Brynen, “Matrix Games at the US Army War College,” PAXsims, 2 September 2016.

¹⁴ Details on the Lasgah Pol game, as well as other matrix games developed by John Curry and Tim Price, can be found at “Professional Wargaming,” Wargaming.co, History of Wargaming Project, accessed 28 January 2022.
Figure 8. Lasgah Pol game board

Source: courtesy of John Curry and Tim Price, History of Wargaming Project.

Figure 9. Lasgah Pol player factions

Security Force Commander:
- Improve Security.
- Maintain Local National Primacy and avoid undermining the local forces.
- Avoid Casualties.

Afghan National Police Chief:
- Insist that you are the Law - not the ANA.
- Supplement your meagre wages from an ungrateful Government.
- Do anything for a quiet life and avoid getting killed.

Taliban Commander:
- Kill the Infidel!
- Discredit local Government.
- Ensure the Taliban are recognised as a force for alternative Government.

Afghan National Army Commander:
- Be seen as heroic defenders of peace and prosperity.
- Get as much as you can out of NATO (training, equipment, etc).
- Improve security.

District Governor:
- Maintain your position at all costs.
- Improve Prosperity.
- Improve Security.

Tribal Elder:
- Remove Western Influence.
- Sell poppies (it is the only way to maintain income).
- Discredit the Governor.

Source: courtesy of John Curry and Tim Price, History of Wargaming Project.
Figure 10. *Lasgah Pol* game pieces adapted for American tables of organization and equipment

Source: courtesy of John Curry and Tim Price, History of Wargaming Project, adapted by GySgt Dathan Byrd.
Here, students could hone those skills expected from a commander’s enlisted advisor: intuitive thinking developed from long experience, combined with the doctrinal grounding allowing one to speak the same language as officer planners and commanders, all merging so students could rapidly assess a situation, contextualize it, decide, and act, and always in the face of an adversary who was trying to stop them. Students could decide, see the consequences of their decisions in real time, make mistakes, and learn from them without burning through ammunition and supplies or risking lives. Gathered around a simple laminated paper game board, looking into the eyes of their peers to figure out what they were doing.

Such tasks are described in chapter 4 of *Warfighting*, such as orienting on the enemy, decision making, mission tactics, commander’s intent, main effort, surfaces and gaps, and combined arms. See *Warfighting*, MCDP 1 (Washington, DC: Headquarters Marine Corps, 1997), 69–96.
thinking and how their plan could be defeated, students of the Career School course could fix that decision-making deficiency with continuous “reps and sets” against thinking human adversaries.

The successful implementation of the Lasgah Pol matrix game at the resident Career School course in Quantico was soon translated into implementation at the other resident academies, with Gunnery Sergeant Byrd providing each academy with copies of the game, along with faculty development for game facilitators. CEME is also now developing a wargame for the Advanced School course, with a focus on maritime littoral operations. Institutionalizing wargaming across the Marine Corps makes its use vital in the schools that educate the bulk of uniformed population. CEME and Byrd have demonstrated how the three themes of EDCOM’s approach to wargaming—targeting a game to unique school learning objectives, making the simple useful, and leveraging organic talent and expertise—will help make institutionalization stick.

GIVE US MORE

Wargaming at the Expeditionary Warfare School

The Expeditionary Warfare School (EWS) for company-grade officers necessarily has different program outcomes than the Career School, though there is some overlap. Both schools aim to cultivate critical thinking, ethical decision making, and a maneuver warfare mindset; but EWS also has the specific goals of “integrating all warfighting functions across a combined arms [Marine Air-Ground Task Force] MAGTF in Naval and Joint operations,” and “demonstrating proficiency in [the students’] respective [military occupational specialty] MOSs.” Different program, different outcomes, but the same requirement levied by the CPG: use wargaming to fill deficiencies in decision-making opportunities against thinking adversaries. The challenge

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17 Berger, Commandant’s Planning Guidance, 19.
lay in finding a way to game the future maritime, all-domain environment that was rich enough to present the problem set while accessible enough that learning and playing the game did not become an all-consuming task in its own right.

A unique opportunity to meet this challenge presented itself early in 2020, when Sebastian Bae, a nonresident fellow at the Brute Krulak Center for Innovation and Future Warfare and a former Marine, approached the center’s staff with a concept pitch. Bae instructed wargame design for a number of graduate programs, including the Gray Scholars Program at MCU; so, was there any interest in leveraging his wargaming network in his capacity as a fellow to develop a Marine Corps-specific educational wargame? The ultimate audience for this game would be operational units across the FMF; but as a first step toward that goal, Bae’s team could introduce the game to a group of MCU students to achieve a PME school’s learning objectives while using student input to hone the game for Fleet Marines. Following internal discussions with the MCU schools, the leadership at the Expeditionary Warfare School found the proposal offered a chance to meet both formal learning and wargaming objectives and targeted the Marine Air-Ground Task Force Operations Afloat Course module in spring 2021 for the game’s execution.\(^{18}\)

Approval was just the first step; Bae and his team now had to craft a detailed game design philosophy for this unique project. The end state was a game that was accessible and flexible for unit-based educational wargaming, depicting a near-future Joint, all-domain, maritime battlefield with an acceptable level of abstraction. The game would require little to no overhead to maintain, and everything needed to understand and play it would be in the box. The design team ensured the game’s low overhead by capitalizing on the many materials and mechanics already available in commercial wargaming. These resources

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\(^{18}\) The initial discussion of this eventual collaboration was through text messages and phone calls with Sebastian Bae and the authors.
included using common materials like wooden blocks to create the fog of war for the players, and design tools like Component Studio for capability cards. The team also adapted commercial game rules and player mechanics, such as visual player aids and tutorial videos. Layered over all of this was current and relevant topical content to maximize the game’s educational value.

Everything from General Berger’s comments shortly after the release of his CPG in 2019 to the most recent presidential “Interim National Security Strategic Guidance” and secretary of defense “Message to the Force” have carried the same message: “prioritize China as the pacing threat.” So Bae’s team developed scenarios on game maps depicting key terrain in and around the Indo-Pacific region, with the friendly blue force modeled on the Marine Littoral Regiment (MLR) construct and the Chinese force based on the People’s Liberation Army Navy Marine Corps (PLANMC). Each side had a variety of ground combat, long-range fires, logistics, and naval units that players could task organize to achieve their scenario objectives. Each side could also invest in Joint Capability Cards, which abstracted different strategic and higher-echelon fires; maneuver; interception of missiles and aircraft; information operations; and command, control, communications, computers, cyber, intelligence, surveillance, and reconnaissance (C5ISR) assets that a

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19 For a short summary of block gaming pieces, see Jackwraith, “An Introduction to Block Wargames,” ThereWillBeGames, 9 January 2021. Component Studio is a browser-based system of game component design tools, which provides users with either the print and play PDF files that allow game designers to make their own prototypes at home or lets designers send the prototype files to a professional component manufacturer. See “Component Studio Features,” Component Studio, accessed 29 March 2021.


21 The game’s MLR order of battle differs slightly from that in the Tentative Manual for Expeditionary Advanced Base Operations (Washington, DC: Headquarters Marine Corps, 2021), as initial game design work was done several months prior to the manual’s release using the information publicly available at the time.
company grade officer could reasonably expect to encounter and employ on a future Joint all-domain battlefield.

The final—and perhaps most important—considerations in the game’s design combined two elements to ensure the game would indeed be practical in the sense of maximizing opportunities for Marines to use it. The first element was keeping the rule set simple and intelligible, so that players could be reasonably expected to pick it up and play it without the aid of a facilitator. Bae included options for more advanced rules, as well as expansions for different geographic locations and scenarios using the core rule set; but a player could understand the core game mechanics and initial scenario with 30 minutes of study. The second element was a research plan that rigidly hewed to public domain, open-source reference material in developing the tables of organization and equipment and Joint capabilities for both sides. Merge these two elements with the design philosophy, and the end result was a wargame with a low learning curve for execution; no requirement for specialized materials or equipment to maintain; and open to the widest possible audience of Marines, international military, and other potential players inside the PME continuum and across the FMF and Joint force.

Now titled *FMF: INDOPACOM*, the wargame went through an aggressive regimen of play testing in the months leading up to its introduction to the EWS student body. Bae’s team, Kru-lak Center staff, EWS faculty, and Georgetown University graduate students refined the rules, gameplay mechanics, and unit capabilities; partners at the Marine Corps Intelligence Activity on Quantico worked with open-source maps and terrain assessment to ensure each scenario had realistic impacts to mobility and maneuver. Once refined, Bae’s group reproduced 16 full copies of the game so that every conference group at EWS would be able to play its own force-on-force session. By spring

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22 Jack Murphy, “Former Marine Invents War Game to Cultivate Tactical Thinking in the Corps,” Audacy, 6 December 2021.
2021, this wargaming conglomerate was ready to put *FMF: INDOPACOM* in front of EWS’ student body for the test that really mattered. From 15–16 April 2021, almost 200 Marine Corps, Joint Service, and international military students at EWS dedicated their waking moments to out-planning, outthinking, and outfighting...
their classmates as either an MLR, supported by the Joint force and allied partners; or the PLANMC, with more limited conventional forces but a broad array of asymmetric capabilities that could deceive, inveigle, or obfuscate the blue force from achieving its objectives. No two games were the same—some matches became two-way, long-range strike slugging matches, others involved aggressive and risky maneuvers to break out of the limited mobility corridors available on the game map, and perhaps the most unique teams attempted to achieve their victory conditions through a combination of cyberattacks, information operations, and influencing local and global opinion, without the crisis ever breaking out into a shooting war. But regardless of how the individual games played out, for two days, the entire student body of an MCU schoolhouse was engaged in continuous decision making against responsive, adaptive, and creative thinking human adversaries in the form of their peers.

Student feedback on this two-day wargaming immersion could best be described as “more”—more chances to play FMF: INDOPACOM during the academic year; more copies of the game available to get better at it and better at outthinking their fellow students; more opportunities in general for engaging in this type of dynamic, free-play, force-on-force decision-making activity that forced them to plan, continuously adapt their plan when their adversary did something unexpected, and learn in real time how to allocate limited capabilities effectively against a well-equipped enemy who was constantly trying to neutralize them. The pick-up team of current and former Marines that worked to make FMF: INDOPACOM a reality is looking at building on the lessons learned from the first EWS iteration to make future educational exercises even more impactful, as well as options—such as a digital version on Tabletop Simulator—to make the game more widely available beyond the confines of
the classroom. But whatever this specific game’s future, its design, testing, and execution at a PME school within a year testify to the power and potential of the three themes within the EDCOM model of institutionalizing wargaming.

**WARGAMING THE OPERATIONAL ART OF WAR**

**Command and Staff College and the School of Advanced Warfighting**

As noted with CEME and EWS, the Service schoolhouses have different learning objectives and program outcomes. Different goals require different wargames, and MCU’s schools for field grade officers are no exception. The Command and Staff College (CSC) and School of Advanced Warfighting (SAW) were designed to produce graduates who are capable of understanding complex situations, thinking critically, and applying the practice of operational art to situations spanning the spectrum of conflict. While similarities exist in the curricula of the two programs, these courses differ in loci. CSC’s mission is to develop leaders with the knowledge required to serve as commanders and staff within the MAGTF and also with “service, joint, interagency, intergovernmental, and multinational organizations.” By contrast, SAW’s mission focuses specifically on developing “lead planners and future commanders with the will and creative intellect to design and execute joint campaigns and naval expeditionary operations.” Despite differences in mission, both schools utilize planning exercises at the operational level of war to teach and hone staff processes and decision making. The authors would like to note that the

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23 Tabletop Simulator is a sandbox-type online game engine that allows users to either play virtual replications of existing tabletop or analog board games or use software tools to create virtual versions of their own custom-designed games.


Throughout academic year 2021 (AY21), CSC and SAW conducted wargames in conjunction with planning exercises to meet learning objectives and enhance student decision making. Executing their plans against a thinking adversary, students and faculty received cold, hard feedback on key planning questions: Was your plan sound and flexible? Were your decision support tools developed with enough detail to support the execution of this plan as you moved to execution? Did you give your branch and sequel plans the attention that they deserved? In prior exercises, these questions would be answered by military faculty and professors based on their own experience and knowledge. Using wargames in AY21, however, let students “explore in greater detail the rationale behind their assumptions and subsequent decisions.”\footnote{LtCol Matthew Van Echo, correspondence with author, 29 March 2021.} There, again, was that “greatest deficiency” identified in the CPG, and CSC and SAW would use wargames to correct it.\footnote{Berger, \emph{Commandant’s Planning Guidance}, 19.}

A key requirement for using wargames was maintaining the continuity of exercises that already exist within the schools’
curriculum. As few commercially available wargames were built with field grade PME curricula in mind, meeting this requirement necessitated creating custom-tailored scenarios based on codified planning exercises. Once created, these scenarios could adapt to different courses of action and task organizations for students. For three of these events during AY21, CSC and SAW partnered with the Krulak Center—specifically, the center’s technical information officer, Captain Benjamin Herbold—to make this a reality.

The design teams, consisting of Captain Herbold and CSC and SAW’s military faculty, created custom scenarios within the wargame The Operational Art of War IV (TOAW IV). The creation of each scenario started with identifying the learning objective: What do we want the students to take away from this event? The learning objective, translated into the focal point of the wargame scenario, influenced many aspects of game design such as command relationships, unit size and capabilities, and aspects of mobility and supply. It also influenced the mechanism by which students would interact with the wargame, the construction of the white cell, and overall game facilitation. Each schoolhouse deserves a detailed case study to demonstrate this process from learning objective identification through execution.

Command and Staff College’s Pacific Challenge III

CSC’s Pacific Challenge III found III Marine Expeditionary Force (III MEF) engaging a hypothetical Combined Task Force on the eastern side of the Malay Peninsula in a modern-day conflict. The learning objective for the Pacific Challenge III wargame scenario was concise: to develop student proficiency in the execu-

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28 The Operational Art of War IV is a commercial-off-the-shelf digital wargame (Epsom, UK: Matrix Games, 2017). This game is used primarily at the operational and strategic levels of war.

29 The white cell is a term commonly associated with the individuals who run the wargame and those experts who assist in adjudication. In the games referenced in this chapter, the white cells consisted of military faculty and individuals controlling the wargame.
tion of staff functions at the MEF level. This objective required that the game be designed to facilitate targeting and maneuver, provide appropriate feedback, coordinate the translation of student plans to actions in game, and game outcomes to effects provided back to the students.

The design team took multiple steps during scenario design to meet the overall learning objective. First, units were built out at the battalion level to support local maneuver while preventing the need for too much detail in tasking. Second, TOAW IV’s historical equipment database was updated with modern-day capabilities, such as Lockheed Martin F-22 Raptors, Lockheed Martin F-35 Lightning IIs, Chinese YJ-62 subsonic anti-ship cruise missiles, and Tomahawk Land Attack Missiles. Last, potential high-value targets, such as artillery, missile batteries, and air defense systems, were created as separate units to support individual targeting. While these actions would be unremarkable for the commercial game designer or individual user tinkering with the game’s scenario editor, they were deliberately taken to ensure that students could task and target appropriately—a key component of the Marine Corps’ combined arms warfare, and thus a vital learning objective that the wargame needed to model.

CSC executed the scenario in an asynchronous fashion, whereby students leveraged the outputs of TOAW IV without having to devote extra classroom hours (which were not available) to learning the hundreds of menu options and game mechanics. Prior to each turn, student staff leaders briefed their battle rhythm outputs, such as the Commander’s Update Brief, to the white cell by warfighting function. After receiving the briefs and discussing with the military faculty, the game controller would execute each side’s course of action within TOAW IV. The following morning, the game controller would provide situation updates to each side that summarized intelligence.

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30 The white cell for CSC’s Pacific Challenge III exercises consisted of one game controller and four military faculty.
collections, battle damage assessments, and other actions that occurred within their respective areas of operations.

Though *TOAW IV*’s automated adjudication was the primary means of facilitating the *Pacific Challenge III* exercise, the white cell’s impact on execution was equally vital. While all game systems, digital or analog, have shortfalls in one area or another, its successful application is based on the ability of facilitators. For example, during *Pacific Challenge III*, the white cell was required to generate effects for the intelligence collection plan, as well as the operations in the information environment plan, as *TOAW IV* was unable to produce effects in these areas.
Both these adjudication decisions and those produced within the game had to be communicated effectively to students so that they could continue with the exercise.

Overall, the *Pacific Challenge III* wargame was an effective application of a commercial off-the-shelf (COTS) digital wargame to facilitate the CSC learning objective of developing student proficiency in the execution of staff functions. Its asynchronous nature allowed for students to plan out and execute 48 hours of actions while putting their plan to the test against an active adversary. Though imperfect, it provided significant
insight into how an asynchronous game of this nature may be executed using in-house expertise.

**School of Advanced Warfighting’s Singapore Sling**
SAW’s Singapore Sling exercise took students back in time to the Burma theater during World War II, tasking Southeast Asia Command to conduct a slingshot around Singapore against portions of the Japanese Southern Expeditionary Army Group. While the *Pacific Challenge III* wargame focused on student proficiency in a process, SAW’s Singapore Sling had multiple, discrete learning objectives. First, the design team wanted to reward students for their execution of the principles of mass, maneuver, and surprise. Second, students needed to understand the importance of logistics in large-scale naval maneuver. Finally, students had to determine the effectiveness of decision-support tools developed during the planning process. The entirety of the game was executed within a four-hour timespan.

The Singapore Sling scenario was modified from a pre-existing World War II Pacific campaign module within *TOAW IV*. The scale of exercise, level of command, and short timeframe of the game demanded a higher-level of abstraction to support rapid decision making in an area of operations that spanned the Indian Ocean. Ground units were abstracted to the division level with all attachments built within the unit’s table of equipment, and naval units were divided into carriers and separate task groups. This scale was chosen to enable operational maneuver while preventing unnecessary minute manipulations of small-scale forces.

During execution, a single game controller and military faculty member served as the white cell to expeditiously execute actions within *TOAW IV* and facilitate learning. For each turn, students had 20 minutes to receive an update on the enemy, synchronize their staffs, and inform the game controller of desired actions. This structure demanded that students use decision support tools developed during the planning process.
to keep pace with the agility of the game. Further, this structure promoted the concept of rapid decision making against thinking adversaries while being forced to deal with consequences.

A key lesson from Singapore Sling was the effect that the facilitator has on the students’ learning outcomes. Without the ability to translate effects within the game to real-world operational decisions, that is all it is: a game. During Singapore Sling, the facilitator was able to educate throughout execution, getting the students to think of options and outcomes previously unthought of or unseen in their previous experiences. The greatest demonstration of this effect came in the form of a comment from one of SAW’s long-time faculty: “This afternoon I sat through one of the best student-led [after action reports] I have seen in SAW . . . adding dimensions I have not seen in this exercise in prior years.”\textsuperscript{31} And that comment distilled the essence of the CPG’s vision for wargaming—fixing the decision-making deficiency. As the comment also indicated, the EDCOM model for institutionalization made the improvement happen, in real time, with obvious positive results. Appreciating that variation in learning outcomes required variation in the wargame selected, presenting the game to the students in a fashion they could understand and use effectively, and allowing the resident subject matter expert the freedom to leverage their skills in service of CSC and SAW’s needs combined to give Marine leaders something useful and unique.

\begin{flushleft}
\textbf{BEYOND THE CLASSROOM}
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\textbf{Projects, Partners, and Tournaments}
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Decision making and critical thinking do not stop when a student leaves the classroom, and so MCU students are also given several options to continue refining those skills outside formal curricular structures. The Krulak Center, with its mandates for creative approaches to learning and cross-school fusion, has provided a number of wargaming opportunities outside the

\textsuperscript{31} Gordon Rudd email to Mike Morris and Matthew Van Echo, 27 January 2021.
classroom walls. These have run the gamut from support for individual student research projects, to helping external partners leverage the lessons learned from wargaming inside MCU, to competitive tournament play. But whatever the case, the Krulak Center’s approach aligns with the three themes discussed throughout this chapter, with the ultimate goal of creating opportunities to fight thinking human adversaries.32

The Krulak Center has used the digital wargame *Command* for a number of these extracurricular events.33 One external partnership that leveraged *Command* was with the Training and Education Command (TECOM) Warfighting Society, an informal organization stood up under now retired Major General William F. Mullen III when he was commanding general of TECOM. A core aspect of the Warfighting Society’s mission was to use commercial wargames to examine aspects of future problem sets facing the Marine Corps, and especially Expeditionary Advanced Base Operations (EABO).34 First reaching out to the Krulak Center for facilitation support, the TECOM Warfighting Society also contacted Dr. Benjamin Jensen at SAW for scenario design assistance, as Jensen regularly used *Command* for his own courses. Combining this expertise, the TECOM Warfighting Society framed an EABO-centric scenario in which an American Joint Task Force (JTF) would seek to drive back a Chinese force that had taken an airfield and port on the island of Palawan, allowing the JTF to gain a foothold in the Sulu Sea area and push out Chinese naval Surface Action Groups (SAG) to allow freedom of action for follow-on operations. The scenario also included nuances of coalition and diplomatic pressure—the immediate goal was physically driving off the Chinese presence but containing the conflict and giving

32 The following is adapted from Maj Brown’s direct facilitation experience with the activities described, as well as the detailed summary of Krulak Center wargaming activities found at “Wargaming at the Krulak Center,” YouTube, posted 13 July 2021.
China the opportunity to deescalate the situation. The preference was for a diplomatic solution rather than expanding the crisis to all-out regional war, something neither party desired. Framing this wargame event was a large task in and of itself, and then the COVID-19 pandemic forced all participants into a virtual environment before they could execute the live, in-person event. To ensure a positive experience, the Krulak Center developed some additional mechanics that adapted what was functionally a single-player computer game into a multiplayer decision-making exercise that was conducted remotely using video conferencing software.35

Similar to what Captain Herbold did at CSC and SAW, as described above, Major Ian Brown of the Krulak Center received the scenarios and force laydowns for red and blue from the TECOM Warfighting Society. The force deployments were developed in conjunction with subject matter experts leveraged by the society, which included experts on naval and maritime operations, Marine Corps ground combat operations, and individuals involved with the formal crafting of the EABO concept. Major Brown then ran several iterations of the game during several days, with the subject matter experts present via video conferencing and able to make operational decisions in near-real time by passing instructions to Brown, who then implemented them in the game.

Aside from the valuable lessons on the challenges of EABO generated by this event, the group also learned more about what a COTS computer game like Command was capable of simulating; and moreover, they had a better understanding for how to creatively leverage what the game can do to indirectly simulate those missing elements. For example, the plans for both red and blue included deception and decoys; however, higher-level deception capabilities are generally not modeled in commercial wargames due to levels of classification. However,

35 “Wargaming,” Brute Krulak Center for Innovation and Future Warfare Quarterly Newsletter, no. 6 (June 2020), 6.
Major Brown reflected on a fictionalized scenario from his own personal reading years ago that showed how one might use older, conventional capabilities in new ways to deceive an enemy and put them at a disadvantage. This scenario was based on the Soviet Navy’s missile attack on the USS Nimitz (CVN 68) Carrier Strike Group (CSG) in Red Storm Rising by Tom Clancy. In the TECOM Warfighting Society scenario, blue wanted to implement an aerial deception scheme that would absorb some of the Chinese SAG’s surface-to-air missile defenses. In Red Storm Rising, the Soviet Navy reprogrammed old, obsolete target drones to mimic the performance characteristics of more advanced antiship missiles (ASM) and then launched them in a volley at the strike group. On the radar systems of the CSG, the drones looked and acted like ASMs. The strike group launched its own missile defense ordnance to knock the missiles down. It was only when American fighter aircraft got close enough to the incoming threat to visually determine that

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they were decoys that the CSG’s commander understood the deception; at that point, it was too late to do anything about it. The Command Strike Group had exhausted its magazines of fleet defense ordnance, and was helpless when a follow-on volley of actual ASMs struck the force, sinking a full embarked Marine Expeditionary Unit and crippling the Nimitz. As it happens, Command supports U.S. Navy target drone missiles in its game database, so Major Brown added a swarm of those drones into the game as decoys. Those decoys flew a path directly at one of the Chinese SAGs, whose commander then had to make a decision. The Chinese sensor picture did not yet have fidelity on what this cloud of flying objects actually was—it just showed a swarm of something coming at them. This left them with the options of either shooting surface-to-air missiles immediately to defend the fleet and exhausting a finite supply of missiles that they might need against a future threat or holding fire and potentially losing the entire fleet if they did not respond in time.

The Krulak Center also used Command to support a unique student research project. The captains at EWS must complete a research project during the academic year, and they have the choice of writing an argumentative research paper or doing a nontraditional research fellowship. An EWS captain, who was a Marine artillery officer by trade, wanted to do a nontraditional fellowship studying one of the future force design concepts that General Berger laid out in the CPG: converting traditional tube artillery units to rocket artillery units.37 This captain wanted to explore some of the second-order effects of employing rocket artillery in the EABO environment, such as where they should be deployed to be most effective, how quickly they could be resupplied, and how rapidly they could be repositioned to keep them from becoming targets themselves. The captain approached the Krulak Center for assistance in developing a framework to collect the data need-

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37 Berger, Commandant’s Planning Guidance, 11.
ed for the project; and since the center had multiple copies of Command and the computers available to run them, they offered to set up a wargame tournament as a collection vector. The tournament would benefit all parties: it helped the center get more students engaged in wargaming and the EWS student would collect data for their research project. As much as one could in an unclassified environment with COTS software, this project could identify the gaps in the problem set laid out in the CPG and EABO operating concept and help refine them for more advanced wargames and analysis.

The Krulak Center set up a two-day event—one day of training student players on the game system for planning purposes and one day of actual gameplay—with four teams. Each team would take turns playing red and blue, and the team with the highest score won the tournament. However, regardless of who won or lost, the EWS captain would get the wealth of data that Command generates from each game: munitions expenditures, casualties, and game logs of when various sensor systems detected and identified different targets. The captain rolled all of this into the project and then moved on to the unique opportunity the project offered. The research was not simply a school-assigned intellectual exercise, but the leadership of the 12th Marine Regiment was involved in the project’s framework from the outset, and the EWS student briefed the outcomes and lessons from the wargame tournament to 12th Marines leadership once it was complete.38

Even if not directly involved in the full process of a student’s research project, the Krulak Center’s organic wargaming knowledge and experience allows it to act as an informal sounding board in these instances. For example, consider the wargame developed by Air Force Lieutenant Colonel Troy Pierce, who was a student at the Marine Corps War College in AY21. Lieutenant Colonel Pierce created a wargame—Kingfish ACE—that did not focus specifically on combat but gamed the challenges

of executing the Air Force’s Agile Combat Employment (ACE) concept. ACE is the Air Force’s approach to the challenges of the future battlespace, where one must relocate rapidly or run the risk of being targeted, thus requiring the ability to set up and tear down air bases quickly, protect the bases while they operate, all while generating combat power. *Kingfish ACE* put this concept on a game board. Krulak Center staff and wargaming experts from the center’s wider community of interest met with Pierce a number of times as he developed his game, discussing different aspects of game design as the project matured to help refine what worked and improve mechanics that were proving challenging. The center highlighted the final project during its annual Innovation Summit, to both raise awareness of the game and help Lieutenant Colonel Pierce achieve his broader goal: getting this game out to the Air Force to allow fellow servicemembers the chance to grapple with the challenges of ACE before having to execute the concept in reality.\(^\text{39}\) Indeed, the AY21 Innovation Summit featured several student projects that used wargames as their research mechanism.\(^\text{40}\)

The final piece of extracurricular wargaming offered by the Krulak Center is something that Marines enjoy: competition with the promise of recognition for the victor. Wargaming tournaments provide this without the pressure of a classroom assessment or project grade overshadowing the experience. The sole aim is to win, repeatedly, against other teams aiming to do the same; yet, while the only grade is victory, the real prize is the experience of making decisions and outthinking an independently acting human enemy. The center organizes an annual wargaming tournament called Sea Dragon, which is open to teams from all MCU schools. In line with the idea that there is no “one game to rule them all,” and to expose players to different wargaming platforms, each Sea Dragon tournament uses a

\(^{39}\) “Marine Corps War College’s Lieutenant Colonel Troy Pierce Presents for the AY21 Innovation Summit,” YouTube video, 3 May 2021, 12:19 min.

\(^{40}\) For more on the entire event, see the “Academic Year 2021 Innovation Summit” playlist on the Krulak Center YouTube channel, posted 3 May 2021.
different game type. Sea Dragon’s first iteration used a tabletop game from GMT’s NextWar series. In AY20, the center partnered with the Defense Advanced Research Projects Agency (DARPA) to use their PROTEUS (Prototype Resilient Operations Testbed for Expeditionary Urban Scenarios) software, which was a real-time tactical game that modeled DARPA’s “mosaic warfare” concept in an urban environment.

This past academic year, given the uncertainty around in-person gaming caused by the COVID-19 pandemic, the center ran Sea Dragon 2021 in an entirely virtual fashion—the players used the Naval Postgraduate School’s InfoChess web-based game, with Google Meet conferencing software providing virtual rooms where the teams could conduct planning,

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41 There are currently eight Next War games on the market, including Korea, India-Pakistan, multiple supplements, Poland, Taiwan, and Vietnam (Hanford, CA: GMT Games, multiple dates).

in-game strategizing, and battle tracking.\textsuperscript{43} InfoChess combines basic chess rules with many of the challenges discussed at the highest level of the Marine Corps in the CPG and \textit{Force Design 2030}, and within MCU’s curricula: incomplete and hidden information, designing a force based on limited resources and uncertain knowledge of adversary capabilities, and balancing investments in nontraditional domains like information and cyber.\textsuperscript{44} Despite InfoChess’ deceptive simplicity, and the challenges of team players trying to coordinate their actions through the relatively narrow aperture of video conferencing, the discussions on planning and strategizing that developed in each tournament game showed just how deeply the players were engaged with the themes modeled in the game, and were easily the equal of discussions conducted in formal classroom settings during weeks-long exercises.

Despite the volume of ink spilled above, these activities

\textsuperscript{43} \textit{InfoChess} (Monterey, CA: Global ECCO, 2010).

\textsuperscript{44} \textit{Force Design 2030} (Washington, DC: Headquarters Marine Corps, 2020).
are not an exhaustive list of the extracurricular wargaming opportunities promoted by the Krulak Center under the MCU umbrella. But a comprehensive list would only reinforce the narrative laid out here, which is that one can provide myriad decision-making touchpoints through wargames when they are targeted to the learning objective; leverage games simple enough to be rapidly taught to players while still presenting them with complex challenges; and allow the talent extant in servicemembers to manifest itself.

CONCLUSION: LIGHT, NOT HEAT

Despite being two years into the execution of General Berger’s CPG and the institutionalization of wargaming, it is likely still too early to tell whether the EDCOM model will, contrary to past efforts, make wargaming “stick,” but the early signs are promising. Institutionalizing wargaming means that a culture of wargaming must first grow where it was planted and then expand outward—and that, indeed, is happening. This chapter highlights how Gunnery Sergeant Byrd’s efforts at CEME were implemented in academies across the FMF. Sebastian Bae’s FMF: INDOPACOM game has been played by the 11th Marine Expeditionary Unit at Camp Pendleton, the 10th Marine Regiment at Camp Lejeune, the United States Naval Academy in Annapolis, and the University of Kansas in Lawrence among Naval Reserve Officer Training Corps instructors. Additionally, the individual experiences of the hundreds of students who have passed through MCU this academic year had touchpoints with educational wargaming and will export those experiences to their new units after graduation.

Certainly, EDCOM cannot achieve the institutionalization of wargaming on its own, but the model for cultivating a wargaming culture within its walls has proved successful enough that it can be unreservedly recommended to other training and educational entities, as well as the operational FMF. Such efforts would still need to be harmonized under the Commandant’s overarching vision, but at least planting the model in a
multitude of places increases the opportunity for successful growth and linkage. This point also links back to what the authors said at the outset: given that EDCOM annually receives Marine officer and enlisted from the Fleet Marine Force, and then send them back armed with new knowledge, EDCOM is a natural foundation on which to build an institutional culture of wargaming. Foster the culture in PME, and every student who completes a course becomes an ambassador for getting EDCOM’s model out to the operating forces—to the distance PME programs, the planning staffs, and the frontline units who will be the first ones to confront a thinking human adversary. And as stated earlier, the elements of the EDCOM model should not be surprising or controversial. Accept that no “one game to rule them all” exists, nor is such a game necessary, because different training and educational objectives will require different types of wargames to support them. Do not conflate a wargame’s complexity with its utility—a simple game, properly framed to its target audience and well-executed by qualified facilitators, achieves depth of learning because the students do not spend time fighting with the rules, but rather getting the needed “reps and sets” of execution.

Finally, and perhaps most importantly, use the talent of individual Marines to drive institutionalization. Good wargaming is not the rare purview of a few grognards sequestered in a dark room. Marine wargamers are out there, which should surprise no one because wargames are simply another form of competition, and Marines are nothing if not competitive. All of the case studies above were successful because they leveraged current and former Marines who jumped at the chance to put their passion for wargaming to work, and poured themselves into the effort because they believed in the potential wargaming offered to turn Marines into better critical thinkers and decision makers. Capitalizing on that energy is what will make the Commandant’s lamented “greatest deficiency” a distant memory, and what will ensure that the Marine Corps finally makes wargaming stick.