

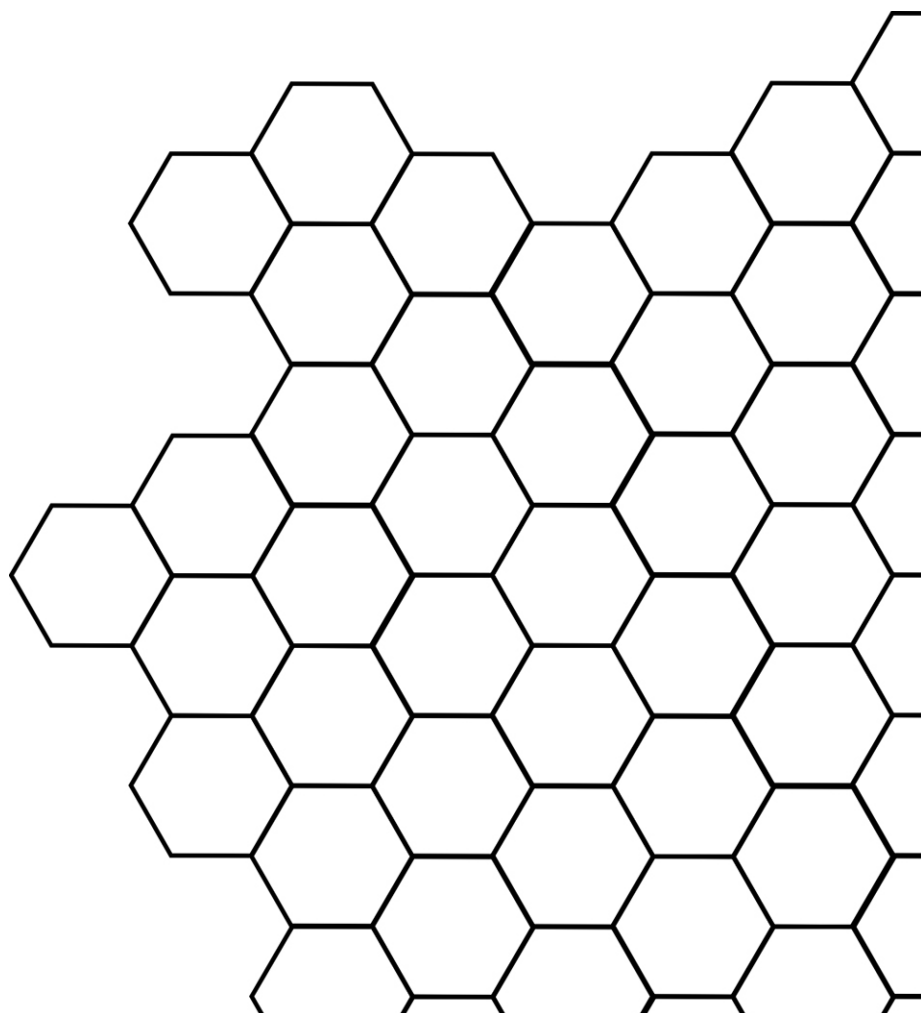
FORGING WARGAMERS

A Framework for Professional Military Education

Edited by Sebastian J. Bae



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Sebastian J. Bae

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FOREWORD

During the 2020 Connections Wargaming Conference, author and wargaming consultant Graham Longley-Brown summarized his recently published book, *Successful Professional Wargames*, by distilling each of its 26 chapters; looking for a more finite response, the moderator pushed Longley-Brown to summarize the entire book to one point. His answer: “Wargames are about people.”¹

This seems like a simple answer, but it gets to the heart of what makes wargaming work. We know all models are wrong, but George E. P. Box’s warning extends particularly to models of human activity that leave out the human element.² We can construct a very good model of how a ball moves when acted on by forces, but it tells us very little about soccer, baseball, or cricket. By adding competitive human decisions to the simulation, wargaming emotionally engages the participants through competition. As a result, participants in wargames remember pivotal decisions, points of crisis, and moments of *satori* for the rest of their lives. Wargames are inherently experiential, and therefore wargames are inherently educational, because the players learn from experience.³

Anecdotally, the military lost its culture of wargaming in

¹ Graham Longley-Brown, *Successful Professional Wargames: A Practitioner’s Handbook*, ed. John Curry (Bristol, UK: History of Wargaming Project, 2019).

² “Remember that all models are wrong; the practical question is how wrong do they have to be to not be useful.” George E. P. Box and Norman R. Draper, *Empirical Model-Building and Response Surfaces* (New York: John Wiley, 1987), 74.

³ For an easily read discussion of how games stimulate the same parts of our brains that learning from real experience does, see Raph Koster, *A Theory of Fun for Game Design* (Scottsdale, AZ: Paraglyph Press, 2005), 12–33. Koster argues that people enjoy games precisely because they learn from them.

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the 1990s, as disruptive technologies drove manual wargaming out and replaced it with computer wargames.⁴ Computers offer real capabilities; but in doing the work for us, they all too often ensure that we do not understand how they arrived at results, and thus we cannot learn from them. Worse, many senior leaders expect wargames to act as an electronic oracle providing fast evaluations of plans. By removing human understanding of the course of events leading to the computer's pass/fail evaluation, there is no understanding of the answer and thus the value of conducting the wargame is lost. Douglas Adams provided an eerily prescient parody of this in *The Hitchhiker's Guide to the Galaxy*, where a supercomputer is tasked to provide the "Answer to the Ultimate Question of Life, the Universe, and Everything." Thus, 7.5 million years later, the supercomputer delivers its simple but incomprehensible answer: 42.⁵ Wargames are about people, and they become pointless when we remove the people from them.

At the U.S. Army Command and General Staff College (CGSC), one of our goals is to "Create an Army of Wargamers"—an Army in which everyone understands wargaming and uses it routinely and well. In our pursuit of this, we support the use of wargames in education across many different courses; teach courses on the selection, utilization, and design of wargames; run the Wargame Design track in the CGSC Master in Military

⁴ As recently discussed in Sebastian J. Bae and Maj Ian T. Brown, USMC, "Promise Unfulfilled: A Brief History of Educational Wargaming in the Marine Corps," *Journal of Advanced Military Studies* 12, no. 2 (2021): 45–80, <https://doi.org/10.21140/mcuaj.20211202002>; and Col Eric M. Walters, USMC (Ret), "Wargaming in Professional Military Education: Challenges and Solutions," *Journal of Advanced Military Studies* 12, no. 2 (2021): 81–114, <https://doi.org/10.21140/mcuaj.20211202003>.

⁵ Adams' novel presents a group of hyperintelligent beings who demand the answer from the supercomputer Deep Thought, which takes 7.5 million years to compute and verify the answer of 42. Deep Thought points out that the answer is meaningless because the beings who demanded it never knew what the question was. Adams would later claim in a 1998 interview with Iain Johnstone of BBC Radio that there was no deep analytical meaning behind the number 42; rather, he was looking for a simple ordinary figure. Douglas Adams, *Hitchhiker's Guide to the Galaxy* (London: Pan Books, 1979).

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Art and Science program; and offer frequent opportunities for voluntary hobby wargaming.⁶ We also operate to support the Army Modeling and Simulation Office's wargaming education program. While we may never fully succeed in creating an army of wargamers, even partial success is worthwhile for its improvement of the force.

The effort consists of three core tasks. First, we need to use wargames in education, for the direct educational benefits they provide, and because doing so provides initial exposure to wargaming and education by the good example of its value, which in turn serves as a recruitment mechanism for the core cadre of wargamers. Second, we need to educate wargamers to develop the core cadres who will design and facilitate wargames across the force in both classrooms and units. Third, we need to ensure that end users of wargame products understand wargaming so they make appropriate use of their results. All of the authors within this edited volume address at least one of these lines of effort.

Timothy J. Smith provides a proven example of using wargames in education, carefully backing up their utility for both educational theory and measured outcomes. While the specific example covers training naval intelligence analysts, the point is much more broadly valid. Wargaming in the classroom comes at a real cost in time and effort, and we need studies such as this one to help convince our educational institutions that the time and effort pays off in improved outcomes; otherwise, we will not be able to expand the use of wargaming in curriculum and fail in the first task.

Dr. Kyleanne Hunter argues that educational wargaming needs to begin at the lowest possible level, focusing specifically on adapting wargaming into precommissioning courses. This should improve their overall education and simultaneously introduce and teach the use of wargaming at the beginning of

⁶ "Wargaming Courses at the Command and General Staff College," eduwargaming.org, accessed 6 January 2022.

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officers' careers. This early recruitment of the wargamer cadre should be instrumental in spreading effective wargaming across professional military education.

Along similar lines, Group Captain Jo Brick and Lieutenant Colonel Scott Jenkinson argue that the Australian military needs to create formal positions within its educational institutions so that each has personnel whose job requires them to provide professional wargaming support and advocacy. These people can teach the courses and support others' instruction to provide formal education and good examples, and help promote hobby wargaming to further assist in recruiting the wargaming cadre. Moreover, they note that these professionals need to organize and attend seminars and conferences on wargaming in order to expand their efforts and trade best practices with their colleagues.

Major Paul M. Kearney focuses on the critical need to increase the scale of the pipeline producing wargamers. He contends that the pipeline should leverage commercial wargames and wargame design practica, aiming to recreate many of the steps of a hobbyist's accidental pathway into professional wargaming through a structured introduction. Properly applied, this should help expand the ranks of the wargaming cadre.

Major Ian T. Brown and Captain Benjamin M. Herbold similarly argue that the Marine Corps needs to create a structured program to train a cadre of wargamers who will carry wargaming back to their units. They see Education Command (EDCOM) as the key means of doing this: conducting wargaming education across all levels of EDCOM, with games tailored to each schools' curriculum as explained in their selected examples. Dedicated institutional support, they conclude, is necessary to make wargaming's current popularity more than a passing fad.

When we educate wargamers, what skills do they need? Unfortunately, different applications of wargaming require a mix of skills. Natalia Wojtowicz summarizes her extensive research for an answer to this question, and categorizes the vari-

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ous applications and the skills that they require, assisting those who will train the wargaming cadre.

Equally important, we need to educate the sponsors of wargames. Dr. Jeff Applegate and Dr. Robert Burks go well beyond noting the necessity of this education, and provide specific advice to wargamers for ensuring the sponsors have both clearly explained their objectives for the wargame, and understand what they can and cannot get from it. Clear, tested guidelines such as these assist the wargaming cadre in learning to ensure a successful wargame.

Education of sponsors extends beyond the military. Dr. Brooke Taylor argues for the need to increase the inclusion of congressional members and staffs in wargames to improve the ability of the U.S. Congress to understand what the military needs. Expanding her point, sponsors need to participate in wargames in order to understand their outputs, or they may fall into the trap of getting ultimately useless ultimate answers.

While Timothy Smith used social science techniques to demonstrate the utility of wargaming in the classroom, Dr. Brandon Valeriano and Dr. Benjamin Jensen explore what wargames have to offer social science. They find that analytical wargames offer an opportunity for social scientists to explore problems with contingent outcomes that are often challenging for traditional social science methodologies, and explain a number of concrete examples where this has been done in the past few years.

Each of these authors addresses at least one of the three key tasks. However, their writing is meaningless without our action. Start a wargaming club or support the efforts of a local one or with USA Fight Club (wargaming experimentation group). Include wargaming in the current courses you teach. Offer and teach new courses on wargaming. Both inside and outside the military schoolhouse, work to educate your peers, subordinates, and superiors on better methods of wargaming. Push back against the flawed understanding that limits wargaming.

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ming to a computer-automated black box performed only in course of action analysis. Get decision-makers engaged in their wargames and ensure they are run well. Together, we can expand wargaming and support victory.

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PREFACE

In 2021, I had the immense honor of leading the Wargaming for Education working group for the annual Connections Wargaming Conference. A standing tradition of the conference, each working group sought to add to the wargaming literature, aiming to advance our field through the collection and synthesis of knowledge and experience. As chair, I posed a simple yet pressing question, “How do we establish or improve wargaming education, including sponsors, participants, and future designers?” The question stemmed from the uncomfortable truth that the wargaming discipline has no foundational pipeline, no established pathway from novice to master. Consequently, the wargaming community stands at a dangerous precipice at the convergence of a stagnant labor force and a patchwork system of passing institutional wargaming knowledge. Unsurprisingly, this can lead to ill-informed sponsors, poorly scoped wargames, an unreliable standard of wargaming expertise, and worst of all, risks the decline of wargaming as an educational and analytical tool. This fundamental challenge is a recurring theme throughout this volume and each author offers their own perspective and series of recommendations.

Yet, from its inception, this edited volume was never envisioned as a textbook or definitive manual for wargaming education. Instead, the volume represents the first step toward an answer by gathering expertise and experiences from a wide range of wargaming practitioners, experts, and educators. Ultimately, this volume aims to help raise the next generation of wargamers—to provide the necessary tools and skills for the advancement of our field. In that spirit, each author poses a question of their own:

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In “Professional Wargaming: From Competence Model to Qualifying Certification,” Natalia Wojtowicz asks, “What are the core skills and competencies required for wargamers?”

In “Immerse Early, Immerse Often: Wargaming in Precommissioning Education,” Dr. Kyleanne Hunter asks, “How can wargaming literacy be improved by integrating wargaming into precommission education?”

In “Simulation-Based Analysis and Training (SimBAT): Wargaming in the Office of Naval Intelligence (ONI),” Timothy J. Smith asks, “How can wargames help create better intelligence analysts?”

In “Building Wargamer Designers and On-the-Job Training,” Major Paul M. Kearney asks, “What are the best practices for training new wargamers on the job?”

In “Wargaming in PME: Introducing Wargaming to the Australian Defence College,” Lieutenant Colonel Scott Jenkinson and Group Captain Jo Brick ask, “How can a professional military education institution establish and incorporate wargaming into its curriculum?”

In “Make It Stick: Institutionalizing Wargaming at EDCOM,” Major Ian T. Brown and Captain Benjamin M. Herbold ask, “How do organizations retain and build on progress in educational wargaming?”

In “Wargaming: Sponsor Education,” Dr. Jeff Applegat and Dr. Robert Burks ask, “How do we better educate and inform wargame sponsors?”

In “Wargaming for Social Science,” Dr. Brandon Valeriano and Dr. Benjamin Jensen

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ask, “How can wargames be utilized for social science research?”

In “Whole-of-Government Collaboration: Educational Nuclear Wargaming and Policy-makers,” Dr. Brooke Taylor asks, “How can educational wargames bridge the gap between Congress and the Department of Defense?”

Each chapter lays the initial groundwork of a nascent wargaming educational pipeline in several directions—into the daily work of Service wargaming centers, into the hallowed halls of academia, and into the classrooms of officers and analysts.

The spirit and ambition of this volume is best reflected by a quote from John of Salisbury’s *Metalogicon*, originally penned in 1159:

We are like dwarfs sitting on the shoulders of giants. We see more, and things that are more distant, than they did, not because our sight is superior or because we are taller than they, but because they raise us up, and by their great stature add to ours.⁷

Thus, as we stand on the mighty shoulders of our predecessors, invoking the collective works of Peter P. Perla, Ed McGrady, Philip Sabin, Yuna Wong, and so many others, I hope future generations of wargamers will build on our ever-incomplete work.

⁷ Rita Copeland and Ineke Sluiter provide a deeper discussion of this work in “John of Salisbury, *Metalogicon*, 1159,” in *Medieval Grammar and Rhetoric: Language Arts and Literary Theory, AD 300–1475* (Oxford university Press, 2012), <https://doi.org/10.1093/acprof:osobl/9780199653782.003.0027>.

SELECT ABBREVIATIONS AND ACRONYMS

AAR	after action review/report
ABSG	Army Battle Simulation Group (Australia)
ACE	Agile Combat Employment (Air Force)
ADC	Australian Defence College
ADF	Australian Defence Force
ADFWTC	ADF Warfare Training Centre
AOR	area of operation
ASM	antiship missiles
AWGC	Army War Game Centre (Australia)
BOPSAT	bunch of people sitting around talking
C5ISR	command, control, communications, computers, cyber, intelligence, surveillance, and reconnaissance
CEME	College of Enlisted Military Education
CENTCOM	Central Command
CLA	constraints, limitations, and assumptions
COA	course of action
COTS	commercial off the shelf
CPG	<i>Commandant's Planning Guidance</i>
CSC	Command and Staff College (Marine Corps)
CSG	Carrier Strike Group
CTSA	Critical Thinking and Structure Analysis
DCMP	Data Collection and Management Plan
DIA	Defense Intelligence Agency
DIME	diplomacy, information, military, and economic
DOD	Department of Defense
EABO	Expeditionary Advanced Base Operations
EDCOM	Education Command (Marine Corps)

SELECT ABBREVIATIONS AND ACRONYMS

ELT	experiential learning theory
EOCX	end-of-course exercises
EQ	essential questions
EWS	Expeditionary Warfare School (Marine Corps)
FFM	Five Factor Model
FFRDC	federally funded research and development centers
FICINT	fiction intelligence
FMF	Fleet Marine Force
IC	intelligence community
ICAAP	Intelligence Community Advanced Analysis Program
IPT	integrated product team
INDOPACOM	Indo-Pacific Command
JPME	Joint Professional Military Education
JPMET	Joint Professional Military Education and Training
JTF	Joint Task Force
LVC	live-virtual-constructive
M&S	modeling and simulation
MAGTF	Marine Air-Ground Task Force
MBTI	Myers-Briggs Type Indicator
MCP	Marine Corps Planning Process
MEF	Marine Expeditionary Force
MET	Mobile Education Team
MLR	Marine Littoral Regiment
MORS	Military Operations Research Society
MOS	military occupational specialty
NATO	North Atlantic Treaty Organization
NCO	noncommissioned officer
NHWL	Naval Historical Wargaming Laboratory
NPS	Naval Postgraduate School
NWC	Naval War College
OB	order of battle
ODNI	Office of the Director of National Intelligence
ONI	Office of Naval Intelligence
OR	operations research
PLANMC	People's Liberation Army Navy Marine Corps (China)
PME	professional military education

SELECT ABBREVIATIONS AND ACRONYMS

PoNG	Project on Nuclear Gaming
ROTC	Reserve Officers' Training Corps
S&TI	scientific and technical intelligence
SAG	Surface Action Group (China)
SAT	structured analytic templates/techniques
SAW	School of Advanced Warfighting (Marine Corps)
SimBAT	Simulation-Based Analysis and Training
SME	subject matter expert
START	Strategic Arms Reduction Treaty
STEM	science, technology, engineering, and math
SULE	Small Unit Leadership Evaluation
TDG	tactical decision games
TECOM	Training and Education Command (Marine Corps)
TO&E	tables of organization and equipment
USNA	U.S. Naval Academy
WEIRD	Western, educated, industrialized, rich, and democratic

FORGING WARGAMERS

INTRODUCTION

Heated debates on the definition of a wargame continue to this day.¹ Peter P. Perla, one of the giants of professional wargaming and the author of the seminal *The Art of Wargaming*, characterizes *wargaming* as being composed of four major elements: a synthetic environment, containing an abstraction of conflict, using human decision making, and demonstrating consequences for those human decisions.² In 2016, Perla further defined wargames as “a dynamic representation of conflict or competition in a synthetic environment in which people make decisions and respond to the consequences of those decisions.”³ Admittedly, there exists a variety of definitions of wargaming, but for the purposes of this edited volume, Perla’s definition serves as its foundational touchstone.⁴

The abstraction of human conflict in the form of games is ancient, tracing its roots back to games of antiquity such as *Go* or *Wei Hai*, an abstract strategy game played on a 19-by-19-inch

¹ “What Is a ‘Wargame’?,” *Mentioned in Dispatches* (podcast), Armchair Dragoons, 4 December 2020.

² Peter Perla, *The Art of Wargaming: A Guide for Professionals and Hobbyists*, ed., John Curry (Bristol, UK: History of Wargaming Project, 2011), 23–24.

³ Philip Pournelle, “Designing Wargames for the Analytic Purpose,” *Phalanx* 50, no. 2 (June 2017): 48–53.

⁴ For additional resources exploring wargame taxonomy and its uses, the author recommends Elizabeth M. Bartels, *Building Better Games for National Security Policy Analysis: Towards a Scientific Approach* (Santa Monica, CA: Rand, 2020), <https://doi.org/10.7249/RGSD437>; Graham Longley-Brown, *Successful Professional Wargames* (Bristol, UK: History of Wargaming Project, 2019); and Erik Lin-Greenberg, Reid B. C. Pauly, Jacquelyn G. Schneider, “Wargaming for International Relations Research,” *European Journal for International Relations* 28, no.1 (2021), <https://doi.org/10.1177/13540661211064090>. The aforementioned works provide seminal insights into the design of wargames and the implications for both analysis and education.

board, or *Chaturanga*, a predecessor to modern chess from the Indian subcontinent. Yet, from the perspective of the profession of arms, the development of the *Kriegsspiel* by Georg Leopold von Reisswitz in the early nineteenth century and its continued development by his son, George Heinrich Rudolf Johann von Reisswitz, is the seminal origin point. The Reisswitz's *Kriegsspiel* is a landmark moment for professional wargaming for its departure from legacy systems such as chess and its widespread introduction and adoption into the Prussian military.⁵ Over time, the use of wargames, as tools of entertainment, education, and analysis, has been prolific. H. G. Wells and Fletcher Pratt, both renowned novelists, designed their own wargames to explore warfare and its contours in the twentieth century.⁶ The Second World War featured the predominant use of wargames, ranging from the wargames by the British Royal Navy's Western Approaches Tactical Unit (WATU) to combat German submarine attacks, to the infamous Japanese wargame prior to the Battle of Midway. Since then, wargames have proliferated and evolved into the robust commercial game industry and a vibrant professional wargaming field focused on analysis and education.⁷

But this begs the question: How does one become a wargamer, whether as a player, sponsor, analyst, or designer?

When most professional wargamers are asked how they enter the field of designing or using wargames for the study of conflict, most if not all will sheepishly offer some form of, "I stumbled into it." This author counts themselves among the

⁵ Earlier versions of wargames, such as war chess by Johann C. L. Hellwig, elaborated on the design of chess with additional rules and mechanics such as terrain. Although critical to the development of wargaming, war chess and its variations simply resembled warfare and the Reisswitz's *Kriegsspiel* marked the movement toward simulating warfare.

⁶ H. G. Wells, *Little Wars* (London: Palmer Press, 1913); and Fletcher Pratt's *Naval War-game* (self-published, 1929).

⁷ Jon Peterson, "A Game Out of All Proportions: How a Hobby Miniaturized War," in *Zones of Control: Perspectives on Wargaming*, eds. Pat Harrigan and Matthew G. Kirschenbaum (Cambridge, MA: MIT Press, 2016), 4–21, <https://doi.org/10.7551/mitpress/10329.003.0005>.

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ranks who serendipitously wandered onto the path of the wargamer. Unfortunately, the prevalence of wargamers produced by convenient accidents is not a rarity but a consequence of there being no formal system to produce them. The absence of an established talent pipeline for wargaming—whether as participants, sponsors, analysts, or designers—risks making the wargaming field increasingly small and insular. Within the military, wargaming experience among officers is principally constrained to resident professional military education (PME) and select assignments directly engaged with wargaming as part of the analytical cycle. For the enlisted force, wargaming is tragically a rare commodity largely constrained to enterprising individuals' use of commercial wargames and tactical decision games (TDGs) for unit-based training.⁸ The current wargaming enterprise remains piecemeal and disjointed at best; small islands of excellence tangentially connected to one another.

For aspiring designers, there are only a handful of institutions that offer courses in game design for defense professionals. In the military, this includes the Air Force Institute of Technology (AFIT) at Wright-Patterson Air Force Base, Ohio; U.S. Army Command and General Staff College (CGSC) in Leavenworth, Kansas; Marine Corps University (MCU) in Quantico, Virginia; National Defense University (NDU) at Fort Lesley J. McNair in Washington, DC; U.S. Naval War College (NWC) in Newport, Rhode Island; and the Naval Postgraduate School (NPS) in Monterey, California. On the civilian side, a handful of universities provide wargaming courses in programs focused on security studies, such as Georgetown University, MIT, Johns Hopkins University, McGill University, and King's College London. However, most of these are introductory courses for aspiring designers. After students receive their initial induction into wargaming, there are few avenues for continued learning and development. This is best reflected by Caitlyn Leong's arti-

⁸ Sebastian J. Bae and Major Paul Kearney, "Use Wargaming to Sharpen the Tactical Edge," *War Room*, 8 March 2021.

cle “How to Raise a Wargamer,” where she highlights the variety of challenges facing young designers. She poignantly writes, “Beyond the occasional individual mentor, the connection between student-run wargaming organizations and the professional wargaming community is infrequent—if not nonexistent.”⁹

The trials and tribulations of educating and cultivating a wargaming expertise is a regularly recurring topic and persistent complaint from the community. In 2018, the author wrote that the defense enterprise needed to foster wargaming across the ranks, leveraging a myriad of wargames and tools. This included the use of digital platforms like Steam and designing custom educational wargames to foster familiarity and appreciation for wargaming as a tool.¹⁰ Elizabeth Bartels of Rand offered a two-track solution for wargaming education, tailoring wargaming experiences either to those seeking to become specialists or designers, or those seeking to learn how to leverage wargames, such as sponsors, project managers, and analysts.¹¹ In contrast, Jeff Appleget, Jeff Kline, and Robert Burks argue the U.S. Department of Defense (DOD) should aim to develop and revitalize wargaming expertise within its uniformed ranks. Given the dominance of external organizations in wargaming, such as federally funded research and development centers (FFRDCs) and defense contractors, they argue that this reliance outsources “the intellectual underpinnings of the nation’s defense strategy, officer professional development, and the department’s acquisition process.”¹² Likewise, the 2019 Connections Wargaming Conference, an annual professional conference for wargaming, featured a workshop focused on the next generation of wargamers, both civilian and uniformed

⁹ Caitlyn Leong, “How to Raise a Wargamer,” *PAXsims*, 21 May 2020.

¹⁰ Sebastian J. Bae, “Just Let Them Compete: Raising the Next Generation of Wargamers,” *War on the Rocks*, 9 October 2018.

¹¹ Elizabeth Bartels, “Building a Pipeline of Wargaming: A Two-Track Solution,” *War on the Rocks*, 14 November 2018.

¹² Jeff Appleget, Jeff Kline, and Rob Burks, “Revamping Wargaming Education for the U.S. Department of Defense,” *CIMSEC*, 17 November 2020.

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servicemembers. Unsurprisingly, the discussion was hotly contested on what comprised the best steps forward. Due to the elusive nature of a solution, the question of how to raise the next generation of wargamers remains a perennial topic of debate for the Connections Conference.

The question of developing wargaming expertise is not a sterile academic inquiry, but a pressing imperative with potentially dire consequences. The wargaming community is rapidly approaching an inflection point, where titans of the field are steadily retiring, and the subsequent generation is struggling to fill the void. Meanwhile, even within the Department of Defense (DOD), wargaming remains hampered by misconceptions, prejudices, and a lack of understanding of wargaming's utility and limitations. In "Getting the Story Right About Wargaming," Ed McGrady, a distinguished wargamer and former director of wargaming at CNA, stated, "There is a widespread misunderstanding of what wargaming is and a reluctance to accept both the power and limitations of wargames."¹³ This has led to the misuse and abuse of wargames, ranging from mischaracterizations born from ignorance to malign misapplications of wargaming.¹⁴

Thus, the issues and recommendations highlighted by the authors of this edited volume are timely for the continued development of the wargaming field. The authors explore a wide array of issues, broadly defined within three major themes: cultivating wargamers, applying wargaming for education, and educating external stakeholders on the value of wargaming. Natalia Wojtowicz, Kyleanne Hunter, Timothy Smith, and Major Paul Kearney address various aspects of developing wargamers and wargaming literacy. Meanwhile, Lieutenant Colonel Scott Jenkinson, Group Captain Jo Brick, Major Ian Brown, and Captain Benjamin Herbold explore how wargaming can be ap-

¹³ Ed McGrady, "Getting the Story Right About Wargaming," *War on the Rocks*, 8 November 2019.

¹⁴ Stephen Downes-Martin, "Your Boss, Players, and Sponsor: The Three Witches of War Gaming," *Naval War College Review* 67, no. 1 (2014): 31–40.

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plied for PME. Lastly, Jeff Appleget, Robert Burke, Brandon Valeriano, Ben Jensen, and Brooke Taylor explore how better to inform and engage external stakeholders in wargaming, ranging from Congress to social scientists.

Admittedly, this volume is far from perfect and as editor, I wished I had more time to supplement this collection of works with additional perspectives and voices. Despite my best efforts, this volume is DOD-centric, Anglo-American, and predominantly male—indicative of the poor diversity within the wider wargaming field. Although the demographic of the field is changing, ever so marginally and slowly, there remains a tremendous amount of work to be done. Thus, beyond adding to the wargaming literature, this volume seeks to spur wider discussion about the future of the wargaming field. If you find your voice is excluded from these pages, understand that it is not born from malice, but reflective of a perpetual incomplete work. Consider its shortcomings as a call to arms to write yourselves into the literature of the wargaming community. And when future generations examine this work, the author hopes they look on this volume and its authors kindly and find all worthy shoulders to stand on, despite our shortcomings.

*Sebastian J. Bae*¹⁵
Editor and Working Group Chair

¹⁵ The opinions expressed in this volume are solely reflective of the authors, and do not constitute the official opinion or policy of their respective employers, affiliated organizations, or the U.S. government.

Chapter One

Professional Wargaming

From Competence Model to Qualifying Certification

Natalia Wojtowicz

Is wargaming a profession? Can practitioners call themselves professional wargamers? What qualifies a person as a wargamer? Those questions are elusive due to lack of universally agreed definition of competence or a baseline knowledge that is shared by professionals. By definition, a professional is engaged in a specified activity as one's main paid occupation rather than as a pastime.¹ Wargaming has historically proven its worth, but it is rarely seen as a job or a certifiable skill. In a recent survey conducted during the 2021 Connections Wargaming Conference, only 24 people declared having wargaming in their job description and working on it full-time. Among the responders, three main professional sectors were named as employers: armed forces, government agencies, and commercial providers of wargames. Jobs included lecturing, designing, consulting, analyzing, advising, and researching. Additionally, 75 percent of responders noted more than five years of experience, with salaries ranging from \$60,000 USD gross annual salary in design and facilitation up to \$152,000 per year in leadership positions. Only 25 percent responded that they could be promoted if their knowledge on wargaming increased, most-

¹ Stephen Billett, Christian Harteis, and Hans Gruber, eds., *International Handbook of Research in Professional and Practice-based Learning* (Dordrecht, Netherlands: Springer, 2014), 33–34, <https://doi.org/10.1007/978-94-017-8902-8>.

ly referring to “no formal career path” ahead.² These findings imply that even marked improvement in available education would not automatically provide more opportunities.

In terms of received education, the most common answers to the survey were: self-study and on-the-job training. So not courses, but informal education, is prevalent as a learning tool at the moment. When asked about interest in wargaming-related education, responders’ remarks listed digital wargames, invitations to observe wargames at other institutions, new courses for hands-on design, online tutoring (especially for tabletop simulator), certifications that could be transferred to other jobs, facilitation techniques, and a Wargaming 101 seminar.

Education holds a prominent place in the process of developing a profession, acting as the link between needed training and empowering certification. Given the robust history of wargaming, it can be concluded that professionalization is not proceeding with time, but rather with the organization of professionals in the given area.

Given the low response rate to the survey, it can be proposed that less than 5 percent of the wargaming community is considered a professional wargamer (the qualifying factor being full-time appointment and job description including wargaming).³ Those two factors correspond to the professionalization process described previously in relation to: psychologists, pathologists, or journalists.⁴ Harold L. Wilensky identified five necessary steps for professionalization: starting with full-time employment, establishment of training, established professional association, certification, and a formal code of ethics.⁵

² Survey was conducted by the author, with support from the organizers of the conference.

³ Based on the assumption that the 2021 U.S. Connections Wargaming Conference was attended by approximately 450 participants.

⁴ Billett, Harteis, and Gruber, *International Handbook of Research in Professional and Practice-based Learning*.

⁵ Harold L. Wilensky, “The Professionalization of Everyone?,” *American Journal of Sociology* 70, no. 2 (September 1964): 137–58, <https://doi.org/10.1086/223790>.

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Wargaming has the characteristics of an emerging profession, with most areas being permanently under development but not quite fully established.

AN EMERGING PROFESSION

The process of professionalization requires practitioners to organize toward a recognized status rather than accepting the current conditions. Despite an increased demand for wargaming expertise, often referred to as the reinvigoration of wargaming, support for practitioners remains an event-by-event basis.

Reinvigoration of wargaming initiatives depend on professionals able to design, execute, and analyze results of wargames. Until now, those abilities have been linked to personal interest in gaming and analytical tools known from previous work functions (e.g., intelligence analysts creating players' profiles or technicians previously working with satellite imagery preparing the maps). This combination of independent competence and unstandardized practice caused three leading characteristics in the community of wargamers:

1. Variety in competence: due to personal interest and previous work insights dictating how individuals approach tasks, there is no standardized conduct. It can be viewed as an advantage to harness interdisciplinary approaches or a disadvantage due to lack of replicability of results. In most cases, wargames are seen as singular events. Competence is defined rather through validation from the community than a replicated result. The variety in competence is also clustered, meaning that certain designers will specialize in a given type of wargame or a particular topic. The individual baseline translates into rare agreements on practice and education required to succeed in wargaming.
2. Expanding knowledge base: given the community-based competence validation, there could be a base of knowledge that levels the playing field and allows

for introducing people to the discipline in a reliable way. The case of wargaming is peculiar due to an extensive number of wargames existing (counting in thousands) and limited sources to learn about them (i.e., literature, handbooks, or instructional videos). There are a number (counted in tens) of books that address wargaming as well as handbooks produced within the armed forces, but none of them are universally applied by wargaming professionals. The knowledge base is expanding due to the commitment of individuals rather than an educational initiative.

3. Wargaming is not a recognized profession: it is a rare designation, often limited to a few functions within the armed forces and almost nonexistent at civilian universities or think tanks. That does not mean that wargaming is limited to few people. It is rather taken as an additional function if a person has an interest and experience in gaming. The danger of not rewarding competency with professional progress is a basic deficiency of personnel striving to achieve it.

Lack of recognition for the profession of wargaming has a collateral effect that should not be underestimated. Due to its informal and interest-based key of selection, wargaming has become a community that is open to receiving new talent and encouraging exchange of ideas. It might be precisely because of low competition and high demand combined with a lack of external recognition that produced an innate solidarity among its practitioners. It would be most beneficial to development to retain this solidarity of practitioners while combating lack of recognition of professionals.

Wargaming is also not recognized as an academic discipline, causing a “wrap-around” effect. In short, the topic of wargaming is covered with other, older disciplines, linking it with pedagogy, game theory, or operations research. Publications on wargaming are rare, and in most cases linked to a research

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problem from other disciplines, causing lack of independent research on wargaming.⁶ This in turn causes a lack of academic wargaming professionals, but rather academic staff that undertake wargaming as an additional function.

The limitations in prospects for professionalization described above are consistent with an emerging profession remaining below the status of respected occupation. Wilensky recognized the steps leading toward change, starting from building jobs exclusively dedicated to the subject:

1. Start doing full time the thing that needs doing. *In the case of wargaming, this would require moving from additional function toward the sole duty of professionals. Financially speaking, salary should be connected to competence in wargaming rather than other requirements taking precedence. On a personal level, this would also mean refusing to work on wargaming tasks without remuneration.*
2. Establish training. *Training that leads to certificates gives testimony of qualification.*
3. Create a professional association. *For wargaming, this would require further organization and ways of supporting association members. Currently, the biggest conferences (Connections Wargaming Conference*

⁶ It is worth noting that articles about wargaming are almost never accepted for publication in academic journals. Most articles describing only wargaming without reference to other disciplines can be found in professional military periodicals such as *Phalanx*, *Naval War College Review*, *Inside the Army*, *The Cyber Defense Review*, and *Army History*. Articles that treat wargaming as a link to other disciplines rather than one of its own standing are published mostly in historical context. See Solomon K. Smith, "Pounding Dice into Musket Balls: Using Wargames to Teach the American Revolution," *History Teacher* 46, no. 4 (August 2013): 561–76; on decision making, see Ben Caldecott et al., "Wargaming: Using the Decision-Support Tool to Understand the Likely Success of Different Strategies," in *Crude Awakening: Making Oil Major Business Models Climate-Compatible* (London: E3G, 2018), 27–29; for a subset of operations research, see Robert M. Chapman, "Appraising Warfighting Concepts with Wargaming Simulations," *Military Operations Research* 3, no. 4 (1997): 23–38; or for game studies, see Nick Yee, "The New World," in *The Proteus Paradox: How Online Games and Virtual Worlds Change Us—and How They Don't* (New Haven, CT: Yale University Press, 2014), 9–21.

series) are organized by volunteers who provide their time and skills without financial compensation. This could be further professionalized (by turning the volunteers into employees) with an awareness of rising costs causing limited availability to broader audiences.

4. Political agitation for legal protection of the job territory. *This point is particularly difficult, given that anybody interested in wargaming is at the moment a wargamer. The differentiation of a professional should be linked with training and experience gained through full-time work. The goal is not to discriminate but to professionalize. The requirements create exclusivity needed for separation of job from the interest area.*
5. Formal code of ethics (eliminating the unqualified and unscrupulous).⁷ *Much attention has been given to wargaming pathologies, but not to defining success and avoiding individuals who are unqualified.*⁸ *Given the previous step of association, the code of ethics could be linked with membership or its refusal for individuals who do not follow it. To establish a code of ethics, the norms of wargaming would need to be investigated.*

Rolf Torstendahl differentiated minimum and optimum norms existing in professionals of a given field.⁹ The minimum norm defined the negative aspect—the limitation, deficiencies and faults. The optimum describes what is required and desirable, striving to excellence rather than delineating from insufficiency. Currently, there are “best practices” and “pathologies” described for wargaming, but there is no professional association that oversees how they are implemented. So, within multiple interpretations, there is no structured norm.

⁷ Authors comments shown with emphasis. The numbered items come from Wilensky, “The Professionalization of Everyone?,” 137–58.

⁸ Christopher A. Weuve et al., *Wargame Pathologies* (Alexandria, VA: CNA, 2004).

⁹ Rolf Torstendahl, *The Rise and Propagation of Historical Professionalism* (New York: Routledge, 2015), 44.

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The main dangers of either no norms or the more common straying away from them include:

1. Deficiency in logical consistency, mainly in the use of concepts, which give rise to contradictions. *For example, the eternal discussion about a definition of a wargame that cripples potential rise of theories in the field.*
2. Inability to check the empirical basis of mistakes in the handling of primary source facts. *Since protocols for wargaming are rarely published, replication of results is almost unseen.*
3. Lack of clarity for the relevance of arguments for a specific result. *In many cases, wargames are treated as exploratory and therefore do not collect meaningful data. In practice, that means results are abstract and do not translate into actionable analysis.*
4. Lack of new results.¹⁰ *Innovation requires stepping away from a common base; but given a lack of standard, it is difficult to note the original contribution.*

To regulate the professional code of conduct, the optimum norm needs to be rewarded and minimum norm upheld. Both norms regulate how a field becomes a profession and how the competencies in practice differentiate between amateurs and professionals. Education has the potential to convey those norms to the next generation of wargamers. It solidifies the area of competence and allows for the distinction of competent from incompetent and progression in standards.

EDUCATION OF WARGAMING PROFESSIONALS

Within gamers and the staff of military and civilian universities, a need for wargaming-specific education becomes more apparent.¹¹ Moving the discipline from well-intended hobbyists

¹⁰ Authors comments shown with emphasis. The numbered items are adapted from Torstendahl, *The Rise and Propagation of Historical Professionalism*, 44.

¹¹ James Fielder, "Reflections on Teaching Wargame Design," *War on the Rocks*, 1 January 2020.

to professional practitioners is difficult due to the overarching wargaming goal: practicing decision making against a thinking enemy.¹² This imperative could be extended to all military functions and civilian professions related to security. The enormity of target audience dictates a myriad of solutions addressing different competencies. Educating wargamers requires efforts to channel the available courses to a common curriculum and to identify which skills are in the highest deficiency (and utility).¹³ The following section lists forms of education and types of organizations that offer training in wargaming.¹⁴

Armed forces worldwide are the biggest target audience for wargaming education. Few of them have (or openly describe) wargaming built into their personnel structure and educational institutions. Prominent schools within the known practice include (in alphabetical order): American, Australian, British, French, and German. That is not equivalent to no wargaming outside of this group, but it is simply less known to the public.¹⁵ Traditions differ in culture and forms, but generally education resides in the following categories:

1. **Professional military education (PME)**

PME spans across all competence development within the armed forces. The Joint Chiefs of Staff vision and guidance from 2020 called for leveraging gaming methodologies and wargames leading to “deeper in-

¹² Jeff Appleget, Jeff Kline, and Rob Burks, “Revamping Wargaming Education for the U.S. Department of Defense,” Center for International Maritime Security, 17 November 2020.

¹³ Commonly understood as transferable. It would not be applied to all, but a reference in methods and content linked to competencies used for different courses in varied ways. It is more a destination on a map rather than instructions on reaching it.

¹⁴ Although the section samples existing solutions, it is acknowledged that the list is growing as the chapter is being written. Please contact the author to add your institution to the list.

¹⁵ A view into Russian, Chinese, Iranian, Polish, or other wargaming cultures would be invaluable to practitioners; but due to different reasons, the traditions of those armed forces are not debated, published, or involved in the international community of practitioners.

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sight and ingenuity” of students.¹⁶ One of the students recommended in turn a complementary role of wargames within all levels of study. Jeff Wong prescribed dividing wargaming into three main levels: starting from Service schoolhouses integrating games into curricula for career-level courses, moving into intermediate-level schools teaching about design and execution of wargames, and ending with top-level schools focusing on institutional application of wargames.¹⁷

Where institutions have not yet harnessed the full potential of wargaming, “underground” movements have been prospering in connecting willing wargamers. Fight clubs have been branching out in the United Kingdom, Australia, and Netherlands to organize extracurricular activities for their members.¹⁸ This represents wargaming’s common need and rare professionalization.

PME can mean using wargames as a method to teach skills, as well as a way to determine level of competence (e.g., replacing traditional examination). Among the essential subjects, Jo Brick names the planning process with the following course of action analysis, tactical and operational case studies, civilian experience in a war zone, resource management, strategy, and force design.¹⁹ With those extended goals considered, both Brick and Wong warn against using wargaming without strictly linking it to the learning objective and ensuring it is the best method of reaching

¹⁶ *Developing Today's Joint Officers for Tomorrow's Ways of War: The Joint Chiefs of Staff Vision and Guidance for Professional Military Education and Talent Management* (Washington, DC: Joint Chiefs of Staff, 2020), 6.

¹⁷ Jeff Wong, “Wargaming in Professional Military Education: A Student’s Perspective,” *Strategy Bridge*, 14 July 2016

¹⁸ Sebastian Bae and Paul Kearney, “Use Wargaming to Sharpen the Tactical Edge,” *Rand Blog*, 8 March 2021.

¹⁹ Group Capt Jo Brick, “Gaming and Professional Military Education,” *Forge*, accessed 3 March 2021.

it. This requirement also applies to civilian universities that often undertake a broader perspective and a mix of topics related to security, but they are not limited to proficiency in military skills.

2. **Civilian universities**

Wargaming has been steadily growing in its application to teaching and providing a method for research. There is a prevalent bias against wargaming that has stifled its growth in the past, based around two premises: first, that gaming war would represent its losses as trivial; and second, that it would show mindless escalation of players rather than a fair view of reality. Those biases are admittedly usually raised by those who have never played a wargame with educational goals. Sebastian Bae described his campaign for wargaming at the university as an insurgency: starting with spreading basic awareness, through a building up of teams and collaborations toward a lasting use of educational wargames.²⁰ It is a prompt way of thinking about developing wargaming at civilian universities: despite its high value proven by multiple successful projects at Georgetown University, King's College London, MIT, McGill University, and the Hague University of Sciences, it is a constant challenge to turn the individual drive of lecturers into a lasting educational standard. Universities have high potential to exchange knowledge from other disciplines available to faculty, resulting in educational hybrids of commercial, tailor-made educational tools and experiments in new formats best suited to build competence.²¹

²⁰ Sebastian J. Bae, "Establishing a Wargaming Insurgency at the University," *Forge*, accessed 7 June 2021.

²¹ Antoine Bourguilleau, Philippe Lépinard, and Natalia Wojtowicz, "Wargames for Training Future Managers," *Management et Datascience* 5, no. 1 (December 2020), <https://doi.org/10.36863/mds.a.14547>.

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Wargaming at the universities starts with introduction to the method, often offered as a basic course in game design and conceptualization of real-life problems. Advanced classes teach game design for complex problems, organizing wargames and applying them within organizations. Master classes often focus on innovation and leadership, utilizing wargaming in military, business, and research laboratories.

Students respond to the active mode of learning, and embrace change from the exclusivity of lectures. The novelty must be paired with a chance to practice, prescribed by most programs in the form of playing exemplary wargames and adapting to the required decision making. An element that is mandatory within military wargames and needs to be included in the university wargaming curricula is the debriefing, or after action report (AAR). It ensures that learning objectives are met, and the results are explained rather than only noted.

Universities have the potential to use wargaming in teaching and in experimentation. Similarly, think tanks develop analytical and conceptual wargames applied to target audiences' objectives.

3. **Think tanks**

With the rising need for professional wargames, think tanks have been filling the gaps by researching concepts, complex problems, and executing series of iterations to gather structured results. Educational effects are often not the primary goal, but can achieve increased networking between different target audiences. Due to the scarcity of jobs related to wargaming within armed forces, think tanks are often chosen to design and conduct wargames for government agencies or in preparation of budgetary plans. Common approaches include capability analysis, "what-

if” exploratory wargames and quantitative analysis of simulated scenarios.²² Myriad solutions currently developing within civilian, military, and commercial settings offer different levels of skills and points of reference. The following section presents a catalog of wargaming roles and required competencies.

WARGAMING COMPETENCIES

Wargaming requires a set of competencies, depending on the role in the task. J. D. Smith and S. G. Barker proposed three levels of training/education for wargaming personnel, starting with basic awareness and proceeding to expert:

1. Awareness: basic knowledge of most principles.
2. Practitioner: detailed knowledge of principles and an ability to implement some elements of a wargame system.
3. Expert: expert in principles and with extensive experience in implementing elements of the wargame systems.²³

This description can capture the functional distinction of progress, but it does not define how to reach the next qualification or what is precisely required in preparation for the next level. There are multiple roles discussed in detail, both to differentiate between them and to discuss their educational needs.

PROFESSIONAL ROLES IN WARGAMING

Wargaming as an educational activity requires a desire to exe-

²² John R. Emery, “Moral Choices without Moral Language: 1950s Political-Military Wargaming at the RAND Corporation,” *Texas National Security Review* 4, no. 4 (Fall 2021), <http://dx.doi.org/10.26153/tsw/17528>; and Peter P. Perla et al., “Rolling the Iron Dice: From Analytical Wargaming to the Cycle of Research,” *War on the Rocks*, 21 October 2019.

²³ J. D. Smith and S. G. Barker, “A Consideration of Training and Education in Defence Wargaming” (paper presented at the Proceedings of the 35th International Symposium of Military Operational Research, Royal Holloway University, Surrey, 17–20 July 2018).

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cute, from the exercise director to the observers. Among the main areas of organization, design, control, facilitation, and play, the following personnel roles can be distinguished:

1. Wargame director: *responsible for management of involved personnel and oversight of the coordination and partnerships, ensuring that results are credible and visible for relevant stakeholders.*
2. Wargame planner: *responsible for establishing time lines, planning each step of the wargaming event, reporting on potential scheduling conflicts, and tracking progress toward execution.*
3. Technical expert: *if the topic or format requires specialist support, a technical expert can be employed. They are responsible for their specific expertise delivered toward wargames.*
4. Facilitator: *responsible for explaining the rules of the game, presenting the context and scenario, and moving the wargame through rounds or other progression lines. The facilitator is also responsible for debriefing and enabling feedback exchanges.*
5. Wargame control: *ensuring good coordination and accurate results and looking into any distortions of conduct of the wargame. Control is also often synonymous with the role of information manager, making them responsible for forwarding the information to participants.*
6. Higher command: *acting as leaders who motivate participants, they observe the conduct and evaluate value of the wargame. If the wargame is at strategic level, they might be actively participating in the event in their respective role (as commander or senior officer).*
7. Role players: *taking on a role to replicate issues encountered in reality when interacting with others. Often role players use a script to show the challenge of interaction and stimulate the storyline to progress.*
8. Observers: *noting impressions and observations in or-*

der to provide feedback to wargame organizers or to evaluate the participants.

9. Support personnel: *arranging the logistics and required technical or organizational details.*²⁴

This team view of the personnel might be misleading. Most professionals operate individually or in a small group, especially if wargaming is not placed in a separate branch or organization, but rather an additional function within their regular jobs (as visible in armed forces and universities). The list above covers only the wargame itself, but there is also data collection and analysis that requires qualified personnel. Roles that are more a sign of the current job market than a need within wargaming include project managers and subject matter experts (SMEs). Those two roles are used within organizations to respond to the need for niche expertise and coordination. Largely not discussed, competence resides in the players of wargames, shown either in good understanding of rules and mechanisms or lack thereof. For each of the mentioned roles, there is a catalog of competencies that are required to perform assigned tasks.

ROLES AND COMPETENCIES

The combined wargaming knowledge, skills, and attitude forms the specific competencies. Knowledge is the first requirement that needs to be satisfied. The second element of competencies—the skills—is a reflection of the craft of wargaming. The third element—attitude—is the closest to capturing the art of wargaming.²⁵

If the competencies were the key to distinguish the pro-

²⁴ *How to Master Wargaming: Commander and Staff Guide to Improving COA Analysis* (Fort Leavenworth, KS: Center for Army Lessons Learned, 2021), 21.

²⁵ Col Jeff Appleget, USA (Ret), Col Robert Burks, USA (Ret), and Fred Cameron, *The Craft of Wargaming: A Detailed Planning Guide for Defense Planners and Analysts* (Annapolis, MD: Naval Institute Press, 2020); and John Curry, ed., *Peter Perla's The Art of Wargaming: A Guide for Professionals and Hobbyists* (Bristol, UK: History of Wargaming Project, 2011).

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professionals, the issue of generic and wargaming-specific abilities could be raised. Among the generic competences, the initial distinction of organizational, instrumental (including analysis and design), executive, and innovative units can be proposed.²⁶ The order of these categories can be linked with the prerequisites to excel in later categories. Instrumental skills are needed to execute wargames, and mastery in execution supports subsequent innovation. Without organizational competencies, none of the three categories following it can be applied successfully.

Organizational

- O1. Capacity for organization and planning
- O2. Communication
- O3. Elementary computing skills
- O4. Problem solving
- O5. Teamwork
- O6. Capacity to adapt to new situations
- O7. Project design and management

Instrumental

- IL1. Capacity for analysis and synthesis
- IL2. Grounding in basic knowledge of the profession
- IL3. Information management skills (ability to retrieve and analysis information from different sources)
- IL4. Ability to work on an interdisciplinary team
- IL5. Capacity for applying knowledge in practice
- IL6. Research skills
- IL7. Ethical commitment

Executive

- E1. Decision making
- E2. Critical and self-critical abilities
- E3. Interpersonal skills
- E4. Leadership

²⁶ Generic competences are based on the tuning list for the European Union, as described in Andre Vyt and Antoon Ven, *The Competence Chart of the European Network of Physiotherapy in Higher Education* (Antwerp, Belgium: Garant, 2007), 18.

E5. Concern for quality

E6. Will to succeed

Innovative

IE1. Capacity for generating new ideas (creativity)

IE2. Ability to communicate with experts in other fields

IE3. Initiative and entrepreneurial spirit

These generic competences are not exclusive to the wargaming field, but they are required to plan, organize, execute, and innovate it. The specific competences related to wargaming are listed below.

Knowledge

K1. Functions of wargaming

K2. Methods of wargaming

K3. Basic history of wargaming

K4. Formats and materials required to execute wargame

K5. Mechanics and gameplay

K6. Requirements of debriefing

K7. Modes of data collection

K8. Formats of reporting

K9. Lessons identified and learned from existing applications of wargaming

K10. Players profiles and motivations

K11. Common biases in wargaming

Skills

S1. Identifying objectives of the wargame

S2. Proposing the format best suited to the objectives

S3. Determination of mechanics needed to support the chosen format

S4. Wargame design

S5. Wargame diagrams, illustrations, and graphic design

S6. Writing rules

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- S7. Explaining the rules to players
- S8. Facilitation of play
- S9. Data collection
- S10. Debriefing
- S11. Applying lessons learned process to the wargame
- S12. Reporting results of the wargame
- S13. Outlining limitations and directions for future wargames

Attitude

- A1. High tolerance for uncertainty during unstructured play.
- A2. Curiosity toward new solutions and open to trying multiple designs to determine best fit
- A3. Empathetic to players if wargame is modeling a personally difficult topic
- A4. Energetic during the wargame, ensuring appropriate tempo in execution
- A5. Patient when explaining the rules of the wargame and answering any question in detail.
- A6. Inviting to players and personnel involved in the wargame
- A7. Imaginative in building the atmosphere of the wargame with background information or storytelling
- A8. Determined to keep the wargame within the most relevant topic
- A9. Trustworthy in terms of preserving the results of the wargame without causing harm to players' reputation
- A10. Objective in design, judgment, and execution of the wargame
- A11. Resilient to failing in design, prototyping, and execution of the wargame
- A12. Respectful to any difference of opinions presented in the wargame, as well as players voicing them

Many of the points above could be further extended, for example, knowledge about tactical computer-assisted wargaming simulators as a subset of the methods of wargaming. The level of detail is closely tied with the organization and role of the wargaming professional.

PROFESSIONAL WARGAMING COMPETENCIES MODEL

A discipline-wide model of competence can seem very complex, but it provides an overview of detailed tasks with required competences. It might also serve to zoom in on progression of competence between roles (table 1). Table 2 can be used to see how many competencies are needed for a specific role. If there is a need to analyze a specific role, the competences could be presented within more visible framework.

This role-based view shows which generic competencies are required and what competencies are strictly related to wargaming as a discipline. Those competencies need to be translated into education—ideally linking roles with a qualifying certificate (e.g., a professional observer would participate in a course on competencies enumerated in its competence profile in table 2).

CONCLUSIONS

Wargaming has been treated as an additional function rather than a full-time occupation. It attracts a wide range of professionals, but most people working on wargaming are doing it due to their interest rather than the potential for advancement in the workplace. Professionalization of wargaming depends on a refusal to wargame without reward and practice without norms. Education can bridge the gap between competencies and certificates, providing a step toward remuneration based on qualification.

In summary, wargaming education is not structured or leading to progress within the profession. Partially, this is an unintended effect of a lack of recognition of wargaming professionals, either due to their volunteering for the work or the

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Table 1. Competencies required for professional wargaming roles

Role	Required competencies
Logistics assistant (location and materials)	O1, O2, O3, O4, O5, O6
Spokesperson	O2, IL3, IL4
Coordination (people)	O1, O2, O3, O4, O5, E3
Planner	O1, O3, O4, K2, K4
Project manager	O7, K3, K9
Designer	O2, O3, O4, IL2, IL5, IL6, E1, E2, E5, E6, IE1, K1, K2, K3, K4, K5, K7, K9, K10, K11, S1, S2, S3, S4, S5, S6, S11, S13, A2, A7, A8, A10, A11
Developer	O1, O2, O3, O4, O5, O6, IL2, IL3, E3, E5, E6, IE3, K1, K2, K4, K5, K9, K10, S2, S5, S6, A2, A6, A7, A11
Producer	O1, O5, IL3, IL6, IL7, E1, E3, E4, E5, E6, IE2, IE3, K4
Content-related	IE1, IE2, A2, A3, A4, A7, A8, A12
Technique-related	O3, O4, O6, IL2, IL3, IL5, K2, K4, K5, K7, K8, S2, S3, S9, S13, A2, A5, A9, A10, A11
Analyst	O3, IL1, IL2, IL3, IL4, IL6, IL7, E2, K1, K2, K3, K5, K7, K8, K9, K10, K11, S9, S11, S12, S13, A10, A12
Researcher	IL1, IL2, IL3, IL4, IL6, IL7, IE1, IE2, K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, S1, S2, S9, S10, S11, S12, S12, A1, A2, A3, A6, A7, A8, A9, A10, A11, A12
Director	O1, O2, O5, O6, O7, IL2, IL4, E1, E3, E4, E6, IE1, IE2, IE3, K1, K3, K8, K9, S12, S13
In-game control	O1, O2, O3, O4, O5, O6, IL2, IL3, IL5, IL7, E1, E2, E3, E4, E5, K1, K2, K3, K4, K5, K6, K7, K8, K9, K10, K11, S7, S8, S9, S10, S11, S12, S13, A1, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12
Facilitator	O1, O2, O3, O4, O5, O6, IL2, IL3, IL7, E1, E2, E3, K1, K2, K3, K4, K5, K6, K10, K11, S1, S7, S8, S10, A1, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12
Instructor	O2, IL2, S6, S7, A5
Player	O6, IL4, E1, E2, K11, A1, A4, A6, A11, A12
Observer	O2, O5, O6, IL1, IL2, IL7, K11, K9, S11, A9, A12

Source: compiled by the author.

Table 2. Example of competence profile of wargame observer

Observer competencies	
Generic	Specific
Communication	Common biases in wargaming
Teamwork	Lessons identified and lessons learned from existing applications of wargaming
Capacity to adapt to new situations	Applying lessons learned process to the wargame
Capacity for analysis and synthesis	Trustworthy in terms of preserving the results of the wargame without causing harm to players' reputation
Grounding in basic knowledge of the profession	Respectful to difference of opinions presented in the wargame, as well as players voicing them
Ethical commitment	

Source: compiled by the author.

dismissal of required competencies (leaning toward interested public instead). Several recommendations could be proposed based on gathered insights:

1. Increasing awareness about current undervaluing of wargaming professionals. Economically speaking, what is being done for free will not be paid for. In this case, moving from well-intended passion projects toward full-time jobs is the first step to increasing the reputation of wargamers. Adversely, this also means refusing to volunteer time when the organizations choose to spend their budget elsewhere or even to recognize wargaming as an assignment within job descriptions.
2. To make entry into the profession more accessible, there needs to be a competence model linked with courses that provide required knowledge, skills, and attitude. This means that the profession is transparent

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in the ways it sees wargaming professionals as reaching proficiency and progress from beginner to master. More education linked with competencies in demand, creating a flow from certification toward appointment, for example receiving a certificate as a wargame designer linked with possibility to work in the field.

3. Provide a repository of educational wargames and share source materials, syllabi, resources, and best practices in teaching of wargaming skills. Over time, the standards and competencies should be integrated for a baseline of particular roles that could be certified and transferred to the next assignment (across armed forces, industries, and research institutes).

Wargaming thrives off creativity, but a structured approach to its career prospects and standards could create a profession.

Chapter Two

Immerse Early, Immerse Often

Wargaming in Precommissioning Education

Kyleanne Hunter, PhD

INTRODUCTION

The Department of Defense (DOD) relies on wargaming for both analytical and operational outcomes. Wargames offer a low-cost, low-risk way to educate warfighters on tactics, strategies, and operational concepts to prime their thinking for future battlefields. Additionally, they offer a means to identify and test possible outcomes of new policies or doctrinal changes.¹ While wargaming has been a practice for centuries, it is experiencing a resurgence in popularity and importance among the military Services and is being considered more broadly as a vital part of military education. In 2015, Secretary of the Navy Raymond E. Mabus noted that wargaming is an “invaluable method” for warfighters to test new ideas in a low-risk environment and ordered the creation of a plan to increase wargaming education and build communities of interest.² Marine Corps Commandant General David H. Berger affirmed this when he noted in his *Commandant’s Planning Guidance* that wargaming was essential to “practice . . . decision-making against a thinking enemy.”³ Chief of staff of the Air Force General Charles Q. Brown recognizes that wargames are essential to achieving his directive to “accelerate change” in the face of a changing

¹ Elizabeth M. Bartels, “Wargaming the Department of Defense for Strategic Advantage,” *RAND Blog*, 3 August 2020.

² Raymond E. Mabus, “Memorandum for the Chief of Naval Operations, Commandant of the Marine Corps: Wargaming,” 5 May 2015.

³ Gen David H. Berger, *Commandant’s Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019), 19.

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global strategic environment where U.S. dominance is not assured.⁴ The assertions of the various Services are codified in the Joint Chief's guidance on professional military education (PME), which directs that wargames be integrated across military curricula.⁵

Yet, despite the asserted importance of wargaming to both the intellectual and tactical development of servicemembers, the DOD suffers a dual deficiency when it comes to the application of wargaming. First, servicemembers are most often not exposed to wargaming as a part of PME until they are field grade officers, a decade or more into their careers. Second, and relatedly, the DOD has increasingly relied on a cadre of professional civilian wargamers to design, run, and evaluate wargames to answer questions of future warfare. Taken together, these deficiencies create a dearth of wargaming literacy in the tactical levels of military operations (primarily comprised of company grade officers and enlisted servicemembers) and the inability to leverage the cognitive benefits of developing a wargaming mindset that extends beyond the play of the game. The current structure has made wargaming a transactional exercise rather than a cognitive shaping tool that can give the United States a strategic advantage.

Though the current military educational system has not fully embraced the integration of wargaming, military leadership recognizes the importance of wargaming as educational and cognitive development. The Joint Chiefs' PME guidance recognizes the importance of wargaming not just for the outcomes, but for how the process shapes the intellectual capacity of the force. The introduction states:

There is more to sustaining a competitive advantage than acquiring hardware; we must gain and sustain an

⁴ Gen Charles Q. Brown, USAF, *Accelerate Change or Lose*, August 2020 (Washington, DC: Department of the Air Force, 2020), 2.

⁵ *Developing Today's Joint Officers for Tomorrow's Way of War: The Joint Chiefs of Staff Vision and Guidance for Professional Military Education and Talent Management* (Washington, DC: Joint Chiefs of Staff, 2020).

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intellectual overmatch as well. The agility and lethality of the force must be applied appropriately to deter, fight, and win against adversaries who have studied our methods and prepared themselves to offset our longstanding military superiority. This cannot be achieved without substantially enhancing the cognitive capacities of joint warfighters to conceive, design, and implement strategies and campaigns to integrate our capabilities globally, defeat competitors in contests we have not yet imagined, and respond to activity short of armed conflict in domains already being contested.⁶

A route to achieving this “intellectual overmatch” begins with creating a clear pipeline for wargaming early in a service-member’s career. This chapter discusses one way to establish this pipeline—integrating wargaming as part of precommissioning education. It begins with a discussion of the current problem—why waiting until field grade PME and the reliance on contracted professional wargamers has created a deficiency in developing a force that is prepared to face a near peer adversary. It then discusses how wargaming can be integrated as part of a holistic and immersive precommissioning education program. Examples from the Service academies and Reserve Officers’ Training Corps (ROTC) programs are used to highlight different ways of achieving this. The discussion focuses on the benefits that can be gleaned from adopting this educational pipeline, as well as some limitations. The conclusion focuses on areas of additional research needed, as well as potential challenges to implementing precommissioning wargaming education more broadly.

⁶ *Developing Today’s Joint Officers for Tomorrow’s Way of War*, 2.

Crusty Majors and Comfortable Contractors: Why We Need a New Wargaming Pipeline

Though each of the military Services designs their own PME, a generalizable trend is that wargaming is most robustly integrated into curricula during the respective Command and Staff (or equivalent) schools. Officers typically attend Command and Staff between the 10th and 15th years of their careers. Command and Staff schools mark the transition from an officer's tactical performance and specialization in their given job, to joint- and strategic-level operations. While these more-senior officers can leverage their tactical experience in wargaming, and the intellectual and cognitive skills learned in wargaming are value-added to staff-level strategic positions, waiting until Command and Staff to begin wargaming education results in three primary problems.

First, by the time officers arrive at Command and Staff, they are already fully indoctrinated into their Service's—and often their specific community's—way of thinking. Commissioning education and military occupational schools, in addition to teaching skills, indoctrinate officers into a specific way of thinking. Service culture is ingrained through the transfer of skills and knowledge from one generation to the next, and initial training provides the means for most cultural transmission.⁷ The strongest cultural development takes place within the first five to seven years of a servicemembers' career, when they are taught how to act, think, and perform in accordance with the standards required for their particular Service and job within it, as well as develop a sense of the ritualistic and informal practices that give the Services a distinct culture.⁸ For officers, throughout their company grade years, they are rated and evaluated

⁷ Kyleanne Hunter, "Warrior Culture: Ancient Roots, New Meaning," in *Bulletproofing the Psyche: Preventing Mental Health Problems in Our Military and Veterans*, ed. Kate Thomas and David Albright (Santa Barbara, CA: ABC-CLIO, 2018), 29–42.

⁸ Joshua J. Jackson et al., "Military Training and Personality Trait Development: Does the Military Make the Man, or Does the Man Make the Military?," *Psychological Science* 23, no. 3 (2012): 270–77, <https://doi.org/10.1177/0956797611423545>.

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on how well they conform to particular standards and actions, but also their ability obtain “credibility” in their career field. Pathways for promotion in each career are fairly set, and there is little reward for deviating from a given route. By the time students arrive at Command and Staff, they are firmly rooted in their particular culture and way of thinking. Given the rigidity of their early military experience, it is hard to leverage the benefits of nonlinear thinking that wargaming provides at this stage in their careers.

Second, by the time officers begin Command and Staff, they have likely achieved tactical proficiency in their career field. This is done through obtaining qualifications and completing assignments dictated by the requirements set forth in training manuals and the promotion process. The introduction of wargaming after officers have been tactically focused to achieve professional credibility results in it being seen as an add-on educational tool, which is useful in classroom settings to teach new skills, yet not fully integrated into career progressions.⁹ A consequence of this is that wargaming is stovepiped in military educational institutions and not fully integrated into operating forces. While the PME institutions—particularly at the Command and Staff level and higher—have been deliberate about integrating wargaming, it remains elusive in the operating forces.¹⁰ This remains largely true, despite evidence that having continual touch points with the operating forces is essential to reinforce the cognitive benefits of wargaming and to keep the operating forces agile.¹¹ This is particularly important as service-members are being asked to quickly transition from a focus on counterinsurgency operations to strategic competition and a regional focus from the U.S. Central Command (CENTCOM) area of responsibility to the Indo-Pacific (INDOPACOM). Better

⁹ Maj Ian T. Brown and Capt Benjamin M. Herbold, “Make It Stick: Institutionalizing Wargaming at EDCOM,” *Marine Corps Gazette* 105, no. 6 (June 2021): 22–31.

¹⁰ Jeff Appleget et al., *Wargaming at the Naval Postgraduate School* (Monterey, CA: Naval Post Graduate School, 2016).

¹¹ Brown and Herbold, “Make It Stick.”

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integration of a wargaming mindset in the operating forces will help with tactical agility.¹² Because it is introduced so late in an officer's career and separate from operational requirements, wargaming expertise remains largely segregated from operational implementation. The separation of wargaming from the operational forces has made it seem elusive from much of the operating force, giving it an air of ivory tower status.

Finally, the way Command and Staff education is conducted means that only a fraction of all officers are exposed to wargaming. Due to operational tempo and geographical assignment constraints, online PME is increasingly common. Additionally, Services are increasingly realizing that online PME provides significant cost savings, as servicemembers are not required to move, and can also often accomplish their PME requirements while still in an operational duty status. The Joint Chiefs' instruction codifies that all PME can be accomplished either online or in the schoolhouse, so the trend toward online education will likely continue or even increase.¹³ While many wargames can be played in a virtual environment, the asynchronous nature of most online PME limits the time that can be dedicated to deliberate wargaming. Additionally, the current benefits of PME-based wargaming have been realized through in-person games.¹⁴ A continued trend toward online PME will likely further shrink the pool of servicemembers who understand wargaming and further entrench the educational-operational divide.

A consequence of these problems is that the DOD and the military Services are increasingly relying on professional contractors rather than active-duty servicemembers to fulfill their wargaming needs. While professional wargamers have created valuable games for the DOD and specific military Services, rely-

¹² Sebastian Bae and Paul Kearney, "Use Wargaming to Sharpen the Tactical Edge," *War Room*, 8 March 2021.

¹³ *Developing Today's Joint Officers for Tomorrow's Way of War*.

¹⁴ Brown and Herbold, "Make It Stick"; and Appleget et al., *Wargaming at the Naval Postgraduate School*.

ing on professionals outside of the military organizations raises concerns as well. Jeff Appleget, Jeff Kline, and Robert Burks note that this has led to the DOD outsourcing the intellectual capital that is built by developing and running wargames.¹⁵ It is not only technical expertise that they are missing in this regard, but the expertise and insights that come from iterating on a strategic and intellectual level. Professional wargamers are important for their continuity and the deliberate hours they can dedicate to creating, running, and analyzing games. However, as John Curry notes, the way in which professional wargaming as an enterprise has developed, and the way in which professional wargamers are trained, set standards based on past precedent rather than future-looking opportunities.¹⁶ The relationship between professional wargamers and the DOD further strains their ability to create reactive, just-in-time changes to wargaming scenarios built on lessons learned from the operating forces. The process of creating contracts or project scopes adds an additional lag to the development and implementation of wargames. It also highlights the transactional nature of wargaming, and denies the operators a full understanding of how engaging in games not only can be used to address analytical outcomes, but shape their thinking.

One way to address these problems is to introduce wargaming early in the educational and developmental life of servicemembers. This will not only ensure that a wide range of individual servicemembers are exposed to wargaming—giving the DOD a broader swath of individual personnel capable of meeting their wargaming needs—but also leverage more of the cognitive and intellectual development aspects of wargaming. Wargaming is not just about running simulations or learning history. Especially when used as part of a broader educational curriculum, it develops mental agility and strategic thinking

¹⁵ Appleget, Kline, and Burks, “Revamping Wargaming Education for the U.S. Department of Defense.”

¹⁶ John Curry, “Professional Wargaming: A Flawed but Useful Tool,” *Simulation & Gaming* 51, no. 5 (2020): 612–31, <https://doi.org/10.1177/1046878120901852>.

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skills. From a perspective of developing a talent pipeline for the DOD, it creates the skills to both think creatively about the future fight and fully embrace the principles of joint warfare. Precommissioning education is an ideal place to introduce wargaming to reap these benefits and create broader wargaming literacy among the DOD. This will set the foundation for a career in which officer will continue to build on the principles of wargaming and give the DOD access to a cadre of officers able to think strategically about future problems. It will also allow officers to integrate the cognitive and intellectual principles of wargaming throughout their careers, which will also have benefits for their tactical and operational requirements.

It is worth noting that there is also a benefit to expanding wargaming more deliberately in the enlisted ranks. Major Ian T. Brown and Captain Benjamin M. Herbold note that the fact that enlisted make up a greater percentage of the force in general should be reason enough to focus wargaming on the enlisted ranks.¹⁷ Matthew Reed argues that the demands of the future fight will require a more intellectually agile noncommissioned officer (NCO) core, and that modeling enlisted PME after the current structure for the officer corps (to include the integration of wargaming) is the most effective way to do this.¹⁸ Sebastian Bae and Paul Kearney emphasize that wargaming creates a tactical edge for servicemembers, a skill that would see great benefit in the enlisted ranks.¹⁹ These arguments are important, and increasing the enlisted pipeline for and exposure to wargaming is worthy of much more discussion and policy engagement. However, the focus of this chapter is on the most effective way of growing exposure to wargaming among officers.

BENEFITS OF A PRECOMMISSIONING DOD PIPELINE

Though young officers are expected to be focused on tactical

¹⁷ Brown and Herbold, "Make It Stick."

¹⁸ Matthew Reed, "Rethinking Enlisted Education: Expanding the Professional Military Education Debate," *War on the Rocks*, 19 November 2018.

¹⁹ Bae and Kearney, "Use Wargaming to Sharpen the Tactical Edge."

expertise for the first several years of military service, precommissioning exposure to wargaming has many benefits to the DOD. By introducing wargaming at this early stage in their intellectual and professional development, young officers are developing the cognitive and intellectual curiosity wargaming creates while being indoctrinated into their Service culture. A precommissioning pipeline for wargaming also creates a bigger pool of individuals who are exposed to the principles of wargaming, allowing the DOD to cast a wider net when looking for qualified individuals to build, run, and analyze games. This will overcome and begin to breakdown some of the current stovepipes that exist in the wargaming community, and allow for a more organic transition for servicemembers in and out of wargaming roles. Additionally, most precommissioning education—whether at a Service academy, ROTC, or Officer Candidates School—is in person, providing the ideal environment for achieving the most beneficial wargaming outcomes.

In addition to overcoming some of the deficiencies the current system creates, there are three additional benefits created by a precommissioning wargaming pipeline for the DOD. First, it allows for casting a wider net when wargaming is needed at the Service or Joint level, not just in terms of numbers, but occupational specialties and levels of experience. Exposing young officers to wargaming earlier in their career will create a cadre of company grade officers who are literate in wargaming and can provide different perspectives to Joint- or strategic-level problems. Reaching down into the ranks to those closest to the tactical level can provide additive benefits to more senior-level thinking. During their company grade years, officers are engaged in the tactical level of warfighting. They are the ones integrating new tactics and procedures, integrating new technologies into the battlefield, and implementing new doctrine at the ground level. Their lived experience is just as valuable as the advanced education and strategic thinking that field grade officers bring to wargaming. Having officers under-

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stand wargaming early in their career will provide the DOD with better inputs for their games.

Second, wargaming literacy will give the tactical-level operators another tool to “outthink” the adversary. Providing those who are charged with the tactical decisions the tools to think differently about problems is essential in the changing global security environment. Wargaming is as much about cognitive skills as it is the analytical findings. If officers are introduced to wargaming while they are also learning the key functions of their job, they will incorporate principles of complex thinking and outmaneuvering an adversary as part of their primary job. The skills necessary to be effective on the future battlefield are not just tactical, and introducing wargaming early in the career trajectory of officers will ingrain a competitive edge in how they approach the future fight.

And third, introducing wargaming in precommissioning education allows for more diversity in who is part of wargaming. As noted above, advanced PME is becoming increasingly virtual, shrinking the pool of those officers meaningfully exposed to its benefits. Additionally, the DOD Board on Diversity and Inclusion found that there are racial disparities in who is selected for resident advanced PME and top-level schools, the primary sources for receiving wargaming education. Women and racial and ethnic minorities remain underrepresented in resident schools, meaning that white men receive the majority of in-person wargaming experiences.²⁰ The wargaming community—both within the military and among professional contractors—has acknowledged this deficit, and recognizes that there are negative repercussions to the fact that 98 percent of professional wargamers are white and male.²¹ Introducing war-

²⁰ *Department of Defense Board on Diversity and Inclusion Report: Recommendations to Improve Racial and Ethnic Diversity and Inclusion in the U.S. Military* (Washington, DC: Department of Defense, 2020).

²¹ Sally Davis, “Wargaming has a Diversity Problem,” Wavell Room, 15 January 2021; and Brandon Valeriano, “The Need for Diversity in Wargaming,” *PAXsims*, 7 February 2020.

gaming in precommissioning education will allow for a greater swath of the military to be part of wargaming discussions. As the military is becoming more diverse, this will create an increasingly diverse pool of wargaming-literate officers to draw from, and the ability to leverage the benefits their diversity brings.²²

ADAPTING WARGAMING TO PRECOMMISSIONING EDUCATION: CREATING THE PIPELINE

Creating a wargaming pipeline for the DOD through precommissioning education requires tailoring the wargaming experience to the undergraduate learning environment. Currently, the Service academies and ROTC are experimenting with multiple ways to do this.²³ Though the use of wargaming is different for each, the key principle of immersive education is central to tailoring wargaming education to undergraduate level.

Immersive education focuses on wargaming being integrated throughout the academic curricula as a culminating experiential learning process that creates the basis for a culture of wargaming. This requires addressing some of the unique structural challenges of precommissioning education that make the traditional wargaming educational model ineffective. Indeed, it would be difficult to produce technical or tactical experts given the constraints of precommissioning education. However, there is an opportunity for an intellectual mindset that is rooted in the principles of wargaming. Before examples of immer-

²² "Demographics of the U.S. Military," Council on Foreign Relations, 13 July 2020.

²³ The military academies are increasingly relying on wargaming both for pedagogical purposes and to track undergraduate students' understanding of the principles of game design. These include classroom activities, immersive wargaming environments, technologically advanced modeling and simulation, and design competitions. For examples of what the academies are doing see: "West Point Simulation Center," U.S. Military Academy, accessed 30 March 2022; "USNA Museum, History Department Establish Naval History Wargaming Laboratory," USNA News Center, 5 August 2020; and "Institute for Future Conflict," U.S. Air Force Academy, accessed 30 March 2022.

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sive education are discussed, it is important to briefly discuss the constraints of precommissioning education that must be overcome.

Constraints of Precommissioning Education

The two largest constraints in precommissioning education are time and resources. Classes in precommissioning education—whether at a Service academy or ROTC—rarely exceed 60 minutes in length. For traditional tabletop wargames, significantly more time than an hour-long class is required. Students also have unpredictable schedules, shuffling between classes in mathematics, history, English, science, and military studies. Unless enrolled in a gaming-specific class, there are rarely dedicated educational blocks to dive into gaming, and students' days are so deeply segmented they are likely to forget material between lessons.²⁴ Additionally, the military knowledge base of students in precommissioning education is substantially lower than field-grade PME students. Baseline knowledge about historical battles or campaigns, the structure of military units, or the interactions between parts of the Joint force is minimal.²⁵ To effectively engage in wargaming thus requires quite a bit more preparation on the part of the instructor, further contributing to time constraints. All of this is coupled with the need to balance wargaming with a core undergraduate education.²⁶

Cost and resourcing constraints also pose a challenge. Undergraduate instructors and professors who choose to engage in in-class wargaming have to do so at little to no cost,

²⁴ Simon Lei et al., "Forgetting to Remember Important Course Information: Instructors' Perspectives," *College Student Journal* 45, no. 1 (2011): 36–47.

²⁵ This data is based on the author's experience teaching at the undergraduate level. As course director of the core military studies class, cadets did not have any knowledge of basic military activities. Since there are precommissioning education requirements on Joint force structure, it is a safe assumption that field-grade students have a higher knowledge base than those who have not had this knowledge.

²⁶ While many precommissioning education programs offer electives in wargaming design, where students are able to get a deep dive into the mechanics of games and the ability to analyze outcomes, these classes are not taken by all students and may serve to further stovepipe wargaming if it not more broadly applied.

further constraining what can be done.²⁷ Precommissioning institutions fund what they see as core and required education. Therefore, so long as wargaming is seen as an ancillary elective, it will suffer from a lack of proper resourcing. Clubs and extra-curricular activities have invested in ensuring wargaming opportunities for students; however, the limited nature of these activities does not allow for a true precommissioning pipeline to be established.

Working within these constraints requires a change in mindset about the purpose of wargaming. Rather than using wargames as stand alone, or contained activities, a precommissioning pipeline is best achieved through integrating wargaming throughout the precommissioning educational experience in an immersive and holistic way. This requires viewing wargames not as ends but as a means for achieving learning across the academic disciplines. Though it will take initial coordination across academic departments, it will have positive advantages for the DOD as a whole.

Overcoming Constraints with the “Combat Snow Globe” Approach

A framework for thinking about how to overcome the challenges of integrating wargaming into precommissioning education is the “Combat Snow Globe” approach (figure 1).²⁸ While the various Service academies and ROTC programs approach wargaming in different ways, this approach provides a framework to shift thinking about wargaming from being a discrete operation to a cultural mindset.

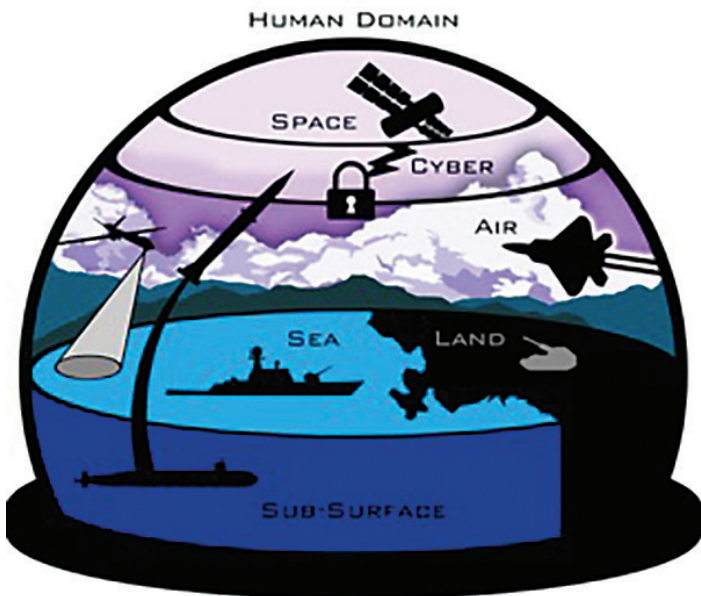
The key to developing a wargaming pipeline for the DOD is to develop wargaming-literate young officers who have a truly

²⁷ M. Scott Bond, “Wargaming at the Academy: Why Invest in NHWLAND and Building a Culture of Wargaming,” Center for International Maritime Security, 4 January 2021.

²⁸ The Combat Snow Globe was conceived and designed by Michael Golembesky during the summer of 2020. Golembesky is the operations manager for the multi-domain laboratory at the United States Air Force Academy, a Marine Corps combat veteran, and *New York Times* bestselling author.

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Figure 1. The combat snow globe



Source: courtesy of Michael Golembesky, U.S. Air Force Academy, adapted by MCUP.

Joint understanding of warfare as part of the cultural indoctrination into the Service and prior to their tactical instruction. The combat snow globe approach does just that. There are three aspects to this approach that can be adopted to different precommissioning educational institution models. First, a focus on inter- and multidomain operations is essential. All Services have recognized that the future of warfare is Joint and multidomain; and the earlier these concepts are introduced, the more likely they are to be seen as a foundational aspect of warfighting and military culture. Introducing multidomain and Joint operations in a precommissioning environment has the further advantage of bringing together several components of undergraduate education in a holistic way. Second, a focus on

a narrative arc to the wargaming approach is required. Rather than focusing on technical or analytical details, wargaming that also incorporates narrative approaches is essential for creating the cognitive and intellectual benefits that a wargaming education brings to future officers. And finally, a human-centered approach to wargaming can bring the benefits of precommissioning wargaming to the forefront. Putting the student first and foremost in the wargaming scenario teaches decision making, strategic and agile thinking, and creative problem solving—the characteristics that senior DOD leadership is calling for from a wargaming education.

Multidomain Operations

Many war games that are used for educational purposes focus on a single domain or campaign. They are often used to teach historical insights or to explore tactical decision making. Single-domain games are also most often used when teaching wargaming to new students focused on wargaming design. There are benefits to gaining expertise in a single domain and the historical expertise of a single campaign. They also provide a good platform for teaching students how to design games. However, single-domain games often require several hours to execute and deep knowledge into one subject area. As noted in constraints, time and tactical/technical expertise required for many historical games or campaign-focused games used at command and staff level PME institutions are challenging to reproduce at the undergraduate or precommissioning level.

Rather than using wargaming to achieve specific tactical outcomes or to train officers in specific operational concepts, precommissioning education can help tie the various educational disciplines that are part of precommissioning education into a multidomain mindset. Undergraduate education is intentionally multidisciplinary. At the Service academies, and in many ROTC programs, this multidisciplinary education is heavily focused on science, technology, engineering, and math (STEM). While the evolving shape of warfare preferences STEM,

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to leverage its advantages it must be put into context. Multi-domain wargaming puts specific aspects of STEM education into context. For example, students who are deeply engaged in computer science are able to better understand that cyber is not a standalone domain, but it is also an enabler for operations in traditional land, sea, and air operations. Students engaged in understanding how hypersonic technology works are exposed to how it shapes decision making about both friendly and adversary actions.

Further, an integrated, multidomain approach to wargaming will help address the need for servicemembers capable of defeating a “thinking adversary” the Joint Chiefs note in the PME guidance.²⁹ For nearly a generation, the U.S. military was engaged in armed conflict with a technologically inferior adversary. Concepts such as air superiority and sea control were not part of the main effort of operations. Additionally, space and cyber capabilities still remain to be tested. The tactics, operational plans, and strategies developed during counterinsurgency operations in Iraq and Afghanistan are not the same as those required to (re)engage with strategic competition. In the coming years, the military will be faced with a technologically matched, if not superior, adversary engaging hybrid warfare strategies that cut across the traditional domains of warfighting. Introducing officers early in their career to how technology plays into strategy and the importance of interdomain operations, will better arm them to address this “thinking adversary.” A deliberate and cohesive multidomain approach to wargaming will also show young officers how the various academic disciplines they are engaged with contribute to the future fight.

Narrative Arc

Given the time and resource constraints of undergraduate precommissioning education, there is little time to play a traditional game. In traditional wargames, the narrative arc unfolds

²⁹ *Developing Today's Joint Officers for Tomorrow's Way of War*, 3–4.

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during the play of the game, or from the historical knowledge of a specific event. Yet, precommissioning education offers other ways of achieving buy-in through broad multidisciplinary engagement of a narrative arc.

As noted in a discussion on multidomain operations, wargaming can weave a thread through different aspects of multidisciplinary education. A unique aspect of precommissioning education—both at the Service academies and ROTC—is that in addition to gaining an academic undergraduate education, there is a deliberate focus on developing military leaders. Stories of warrior heroics, class exemplars, and the use of core values are all common ways used to create leaders of character for the future fight. Including a common story line that can be used throughout a precommissioning education as the basis for an immersive and comprehensive wargame can bring students into a game and overcome some common constraints. A narrative arc as part of the combat snow globe approach does not just focus on playing a linear historical event, but it provides a story more akin to a “choose your own adventure.” It allows students to explore a world and interject their diverse educational backgrounds and personal interests.

An example of this can be seen in Operation Northern Eclipse currently being used at the United States Air Force Academy. This scenario is set five years in the future in the Indo-Pacific region. Cadets are introduced to Operation Northern Eclipse during their core Military and Strategic Studies Course, where they learn principles of joint operations and operational design. This same scenario is integrated into several other courses. Foreign language courses can use the scenario to show the importance of understanding culture in translation. Astrophysics can show how introducing hypersonic technology changes military operations at the operational and strategic level. This core scenario means that courses are not completed in a vacuum, but brought together to create future officers armed with the ability to think in a multidimensional way about the future of warfighting.

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The U.S. Naval Academy (USNA) recently established the Naval Historical Wargaming Laboratory (NHWL), in partnership with the History Department and housed at the USNA Museum. NHWL provides midshipmen with strategic-level gaming to expose future officers to high-level decision making and an understanding of the impact of Joint operations. NHWL provides both for-credit classes and deep immersive experiences that carry throughout a midshipmen's career. Through a mix of tabletop and digital games, they help midshipmen tie their education together, ultimately creating more deeply immersed officers.³⁰

Employing a narrative arc in precommissioning wargaming education creates an understanding as to how small changes in a given field will impact the overall Joint fight. Using the narrative arc as a base, educators can change one small variable and see its larger impacts. Using a standard narrative arc throughout the educational experiences exposes students to the real impact of change. Bringing a consistent story into precommissioning education will give young officers a baseline to tie seemingly disparate threads together and give them key skills to defeat a thinking adversary.

Human Centered Approach

The human domain is the glass that holds the snow globe approach to immersive education together. While there is much focus on technological innovation of the future fight, wars will still be fought by people. Communication, decision making, and information interpretation are the key that future warfighters are going to need to meet the demands of the future of strategic competition. While this immersive educational approach focused on the human aspect of warfighting may not provide precommissioning students with the skills to create war games, it reinforces the need for *thinking* warfighters as the linchpin for the future fight.

³⁰ "USNA Museum, History Department Establish Naval History Wargaming Laboratory."

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An immersive educational approach to wargaming demystifies some of the aspects of practice that often create an artificial barrier to earlier involvement. Through wargaming is encouraged by the chiefs of each of the Services, the chairman, and several combatant commanders, only a small percentage of servicemembers actively engage in wargaming. Most of this is focused on senior leaders and emphasis technical skills rather than a holistic educational approach.³¹ While there is a dearth of studies on the reason why servicemembers do not actively engage in wargaming, anecdotal evidence suggests that the complexity of several games coupled with a lack of early introduction into wargaming makes servicemembers feel removed from gaming and intimidated to start. This, coupled with the fact that wargaming is not integrated into most career fields, continues to stave off wargaming.

The Combat Simulation Lab at West Point is a prime example of a human-centered approach to wargaming. The Combat Simulation Lab places the individual at the center of a virtual world where they can drive the outcomes. The lab is used across different academic and military courses to reinforce the human aspect of lessons cadets learn.³²

While the Service academies are investing in high-tech facilities, expensive equipment is not essential for achieving a human-focused approach to wargaming. ROTC programs have been experimenting with creating end-of-course exercises (EOCX) that put students in roles that grow with them throughout their ROTC career. Such EOCXs—due to the repeatability of their use—create buy-in from students and reinforce the idea that wargaming can be used for cognitive growth.³³

The intention of integrating the human domain and draw-

³¹ Yuna Huh Wong et al., *Next-Generation Wargaming for the U.S. Marine Corps: Recommended Courses of Action* (Santa Monica, CA: Rand, 2019), <https://doi.org/10.7249/RR2227>.

³² For more on the lab's mission, objectives, and products, see "Combat Simulation Lab," Westpoint.edu, accessed 7 January 2022.

³³ William Van Horn, "NROTC Wargaming," *U.S. Naval Institute Blog*, 13 August 2019.

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ing students in precommissioning education into the wargame experience is not necessarily to make experts in creating wargames as undergraduates, but to expose future officers to the cognitive benefits of a wargaming education, while specifically addressing the critical skills Chairman of the Joint Chiefs of Staff notes as necessary.

THE IMPACT OF A PRECOMMISSIONING PIPELINE

While the various precommissioning institutions have unique requirements, and each Service has a distinct culture that they inculcate future officers into, the principles behind the immersive education combat snow globe approach to creating wargaming literacy is a framework that can help create a pipeline for the DOD of agile thinker-doers.

The purpose of this pipeline is not necessarily to cultivate experts in creating specific games, or even the analytical interpretation or application of specific games, but to leverage the intellectual agility wargaming creates. There are, of course, constraints to implementing such an approach as it requires faculty buy-in and cross-departmental coordination and integration. This is often challenging at the undergraduate level, with the time and resources constraints noted above. Experiences at the Service academies have revealed that faculty often feel that if they add in wargaming, they are being forced to drop something from their syllabi. It also requires faculty to learn the scenarios and mechanics of play, as well as standardizing the experience for cadets as much as possible across a broad swath of instructors.

Additionally, it requires an assessment mechanism to ensure that the intellectual principles of wargaming are being absorbed and integrated. Assessing such an abstract concept is often difficult, as it requires tracking students into their early careers and creating consistent metrics across the Services. Additionally, the diversity of faculty involved in this work raises concerns about the fairness of assessing outcomes. While assessment remains a challenge, there is deliberate work being

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done to overcome these hurdles and to create evaluation mechanisms that can ensure that wargaming remains deliberately integrated in precommissioning education.³⁴

The establishment of a precommissioning pipeline, despite these challenges, is essential to create the agile warfighters needed for the future fight. The changes in technology, adversary, and geography that future warfighters are expected to navigate means that they must not only be technically and tactically proficient, but be mentally agile to quickly respond to changing environments. The integration of wargaming with precommissioning education is a necessary tool to do this.

³⁴ Kate Kuehn, "Assessment Strategies for Educational Wargames," *Journal of Advanced Military Studies* 12, no. 2 (Fall 2021): 139–53, <https://doi.org/10.21140/mcuaj.20211202005>.

Chapter Three

Simulation-Based Analysis and Training (SimBAT)

Wargaming in the Office of Naval Intelligence

Timothy J. Smith

SIMULATION-BASED ANALYSIS AND TRAINING (SIMBAT) PROGRAM OVERVIEW

This chapter reports on the history, concept, and status of a wargame-based training and analytic support program the author devised and has implemented in the Office of Naval Intelligence (ONI) since 2008, explaining its pedagogical bases and objectives for learning and development in a military intelligence organization.

Program History and Status

SimBAT originated in two mid-level training courses conducted as concept demonstrators in 2004, both wholly in-house efforts with no contractor support. For the first, the author assembled a team and organized a Battle of Jutland wargame using Avalon Hill's 1967 game on the World War I naval battle.¹ In the second, the team wargamed the Battle of Midway using Avalanche Press's game.² They modified both products for Naval War College-style white cell adjudication, emphasizing blind search on the part of the blue and red (or in this case black) player cells.³ For both of these early efforts, lecture-based train-

¹ James F. Dunnigan, *Jutland* (Baltimore, MD: Avalon Hill, 1967).

² Michael Bennighof and Brian L. Knipple, *Midway*, Second World War at Sea series (Irontdale, AL: Avalanche Press, 2002).

³ Stephen Downes-Martin, "Adjudication," *Naval College Review* 66, no. 3 (2013).

ing was limited to a substantial briefing on naval warfare in the respective eras.

SimBAT proper commenced in 2008, running full scale until the federal budget crisis of 2011 (sequestration), when the program was temporarily cut, resuming in 2014, and then only in truncated form. From 2008 to 2011, the SimBAT team ran a dozen iterations of six different mid-level courses. They commenced first with higher-level hex-and-counter simulations at the mid level but many of the students were junior and found these more quantitative models a discouraging challenge to learn, even with intensive coaching. The team then ratcheted back the complexity of the simulation models, while simultaneously augmenting the content and structure of the larger pedagogical design and method of delivery. Thus, embedded in sound pedagogy (explained below), the wargames provided the warfare model students analyzed in class and then experienced in each course's simulation laboratory.⁴

The team found the *Axis and Allies* game series highly suitable to meet the learning and analytic skills-development needs of ONI's targeted training audience, which consists of analysts primarily in components charged with strategic, operational, and tactical warfare and technical systems analysis.⁵ As fellow wargame *grogards* might imagine, the team was loath to foist on fellow analytic professionals a simulation model featuring plastic miniatures of tanks, ships, planes, and infantry.⁶ However, it was sufficiently well received to warrant adoption as the standard simulation toolset.

The main courses focused on strategy in the Second World

⁴ Technically, *andragogy* or the principles and practices of adult education.

⁵ Larry Harris, *Axis and Allies* (various titles) (Baltimore, MD: Avalon Hill, multiple publication dates).

⁶ The original definition of the term *grogard* refers to an old soldier, or a "grumbler." In current usage, it refers to individuals with deep and extensive expertise in wargaming.

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War in Europe and the Pacific and operations during the Solomon Islands campaign of 1942. The team has run other courses on the Spanish-American War, the Battle of the Atlantic, and tactical air combat.

Program Structure: SimBAT Analysis and SimBAT Training

SimBAT consisted originally of two elements: SimBAT Analysis (SimBAT-A) and SimBAT Training (SimBAT-T). SimBAT-A uses campaign- and mission-level computational modeling and simulation (M&S) to support production analysis. The team ran two such projects in 2004 and 2011. SimBAT-T uses manual tabletop wargaming and historical scenarios. They resumed a few years after sequestration, albeit at a reduced scale. The return of great power conflict (GPC) appears to be increasing demand for resumption on a larger scale.

Both applications follow the same methodology and business process. Being a vehicle for organizational development and learning as well a process for intelligence discovery, SimBAT is governed by specific discovery and learning objectives and is intended to promote a substantial advance in intelligence analytic methodology.

SimBAT Methodology:

Synergy through Paradigm Integration

SimBAT employs mixed-methods analysis and synthesis, integrating intelligence community (IC) analytic tradecraft and Department of Defense (DOD) analytic methodology. The two paradigms are highly complementary in functional capability, each providing a combined arms capability the other lacks and needs. IC analytic tradecraft is informal and qualitative in nature, serving best for the generation and initial vetting of hypotheses. DOD methodology is much more formal and quantitative, complicating the generation of multiple wide-ranging

alternative hypotheses; however, it is much better for testing hypotheses.⁷

Service intelligence centers occupy the nexus between the DOD and the IC, positioning them to lead this methodological paradigm integration (figure 2).

IC analytic tradecraft, as applied in SimBAT, serves the methodological functions of inductive and abductive synthesis, and emphasizes the following methods and techniques:

1. Collaborative teaming
2. Facilitated brainstorming
3. Critical Thinking and Structured Analysis (CTSA) using Structured Analytic Templates (CTSA/SATs) to
4. Generate alternative hypotheses

The DOD analytic methodology, as applied in SimBAT, serves the function of deductive analysis and emphasizes:

1. Formal and quantitative modeling
2. Simulation-based hypothesis testing

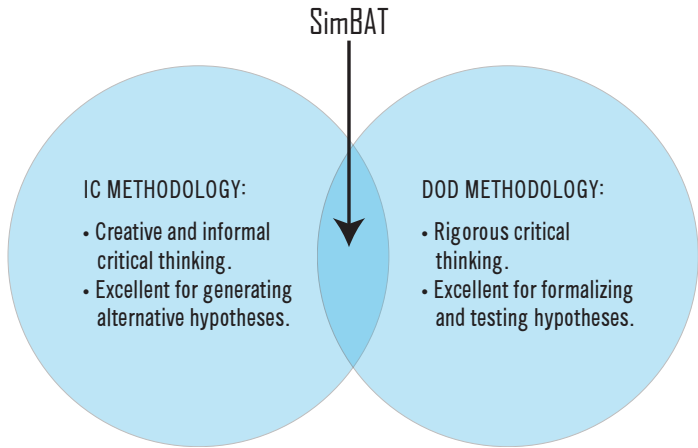
The SimBAT process pursues a discovery and learning spiral commencing with team formation and structured brainstorming and proceeding through the definition of variables and generation and testing of hypotheses, followed by further spirals as needed (figure 3).

SimBAT-T trains analysts in cognitive orientation and reasoning and helps provide the pattern recognition and anomaly detection skills required for effective threat assessment and

⁷ Neither DOD nor IC methodology/tradecraft are documented in any single reference work. Any comprehensive citation would require a bibliographical annex. Military analytic methodology supports the requirements of force and operations planners, including, inter alia, the full range of threat and net assessment, force-structure analysis, campaign modeling; capabilities- and requirements-based analysis and planning, technical systems analysis and design; and the military planning and decision-making processes (MPP/MDMP). All of these involve at least some degree of quantitative rigor, and they include M&S, wargaming, and operations research. Intelligence analytic tradecraft is well-named, for except in military applications, it emphasizes qualitative methods supported occasionally by structured methods for creative and critical thinking, some of which will be touched on below.

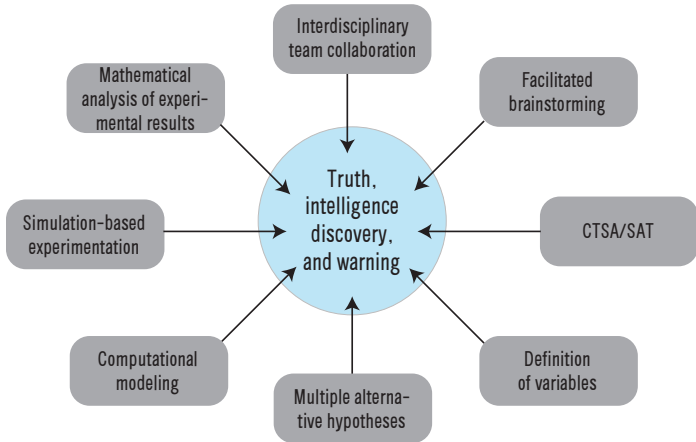
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Figure 2. SimBAT methodology combines the best of two philosophies



Source: courtesy of the author, adapted by MCUP.

Figure 3. SimBAT learning spiral



Source: courtesy of the author, adapted by MCUP.

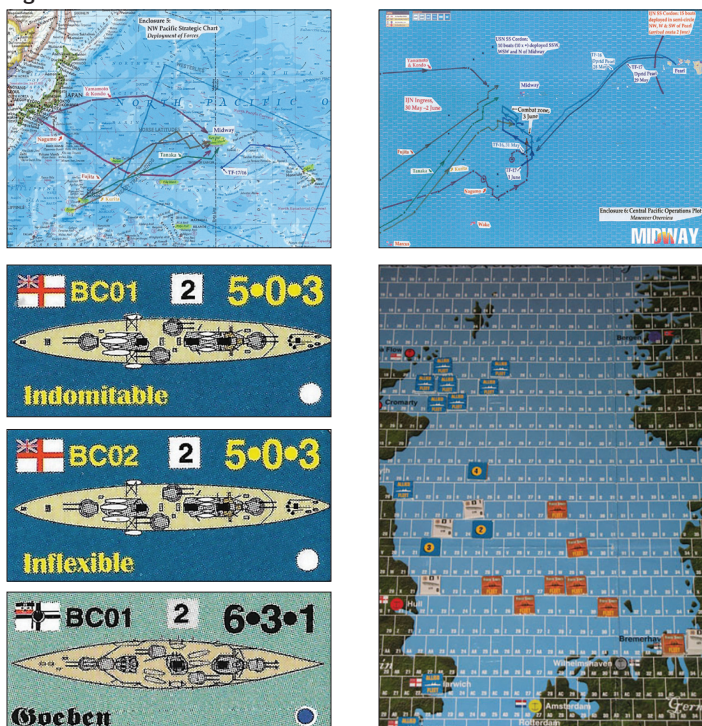
warning. SimBAT-A works directly by teaching military modeling and simulation. Beyond that, however, SimBAT-T supports analysis across the command by training analysts in the basics of military affairs and warfare at the strategic, operational, and tactical levels.

The following images convey the look and feel of SimBAT materials and activity (figures 4 and 5).

THE NEED FOR ADVANCED ANALYSIS AND TRAINING

SimBAT is designed to develop and institutionalize advanced methodology in intelligence analysis and production. The program integrates today's advanced qualitative methods and

Figure 4. SimBAT-T materials



Source: courtesy of Avalanche Press and Hasbro, adapted by MCUP.

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Figure 4. SimBAT-T materials (continued)



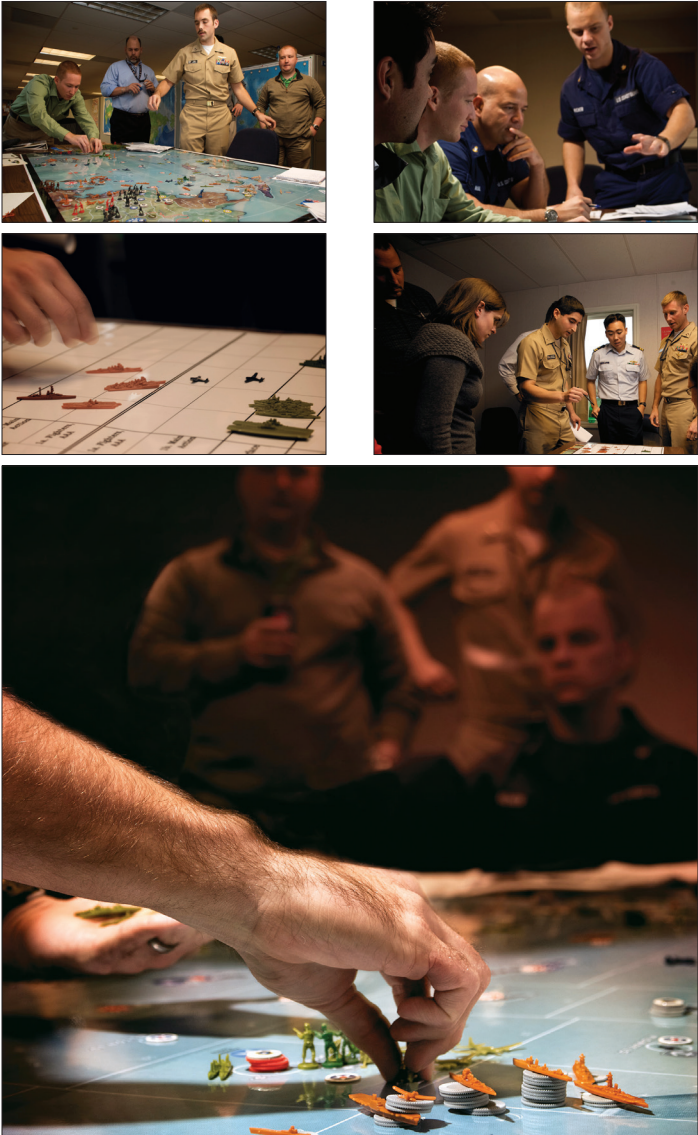
Source: courtesy of Avalanche Press and Hasbro, adapted by MCUP.

techniques while simultaneously laying the foundation for the adoption of more sophisticated and rigorous logical and quantitative methods and tools.

Consistent with today's analytic tradecraft, the SimBAT program emphasizes critical thinking and structured analysis.

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Figure 5. SimBAT Course: Naval Intelligence and Strategy; Scenario: Pacific War, 1941–45; Wargame: *Axis and Allies Pacific*



Source: courtesy of the Office of Naval Intelligence, adapted by MCUP.

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ONI's implementation, however, is more tailored to the military intelligence problem set than it is basic intelligence analytic tradecraft. SimBAT is designed as an integral component of an analyst's career development, and could in the future be offered for IC- wide analytic training. As such, SimBAT is designed to promote ONI and wider IC analytic tradecraft, quality standards, and analytic training requirements.

The author proposes a methodology of “cognitive and computational collaboration” designed to enable organizations to implement this checklist with maximal effectiveness in actual analysis and production.⁸ The intent is to reduce the threat of intelligence failure and surprise through facilitated, laboratory-based collaboration designed to maximize the number of alternative hypotheses analytic teams conceive and explore and to test them all as rigorously as time and money allow. Emerging assessments and forecasts then can be fleshed out with associated indications and warnings (I&W) indicators and potential adversary branches and sequels. The resulting products and support would arm national and theater commanders with deeper insight into the adversary, and a broader scan of the horizon, than intelligence has ever before supplied.

This analytic methodology can be developed with reduced costs and risks by inaugurating it as a training program—one that is conducted as a rehearsal for the real thing—that is, as an analytic project that produces everything but the final intelligence product.

⁸ Timothy J. Smith, “Predictive Network-Centric Intelligence: Toward a Total-Systems Transformation of Analysis and Assessment,” Galileo Essay Contest award winner 2006; and Timothy J. Smith, “Computational Collaboration: Methodology for Predictive Intelligence,” Galileo Essay Contest honorable mention 2007. The 2006 paper was published in an abridged format as “Predictive Warning: Teams, Networks, and Scientific Method,” in Roger Z. George and James B. Bruce, eds., *Analyzing Intelligence: Origins, Obstacles and Innovations* (Washington, DC: Georgetown University Press, 2008), chapt. 17.

Today's Advanced Methodology: Cognitive Collaboration

The current generation of advanced qualitative methods and techniques subsumed under the rubric IC analytic tradecraft includes interdisciplinary collaboration, facilitated team brainstorming, and Critical Thinking and Structured Analysis (CTSA). CTSA includes a variety of Structured Analytic Techniques (SATs), such as red cell brainstorming, key assumptions checks (KACs), multiple alternative hypotheses, and the analysis of competing hypotheses (ACH). These concepts are taught at the Central Intelligence Agency's Sherman Kent School for Intelligence Analysis and at DIA's Joint Military Intelligence Training Center (JMITC).⁹ The core principles involve the penetration of the adversary mindset and the generation and serious consideration of multiple alternative hypotheses concerning their capabilities and intentions. Fully implemented, advanced qualitative methodology can foster a dramatic improvement in the quality of intelligence analysis, especially in nonquantitative domains such as social and political intelligence. For highly quantitative domains such as warfare (and economics, science and technology, etc.), qualitative methodology, although absolutely necessary, is insufficient, failing to exploit quantitative methods and tools widely available outside of the IC for analyzing complex problems.

Tomorrow's Advanced Methodology: Computational Collaboration

To master the science of prediction, and indeed, simply to remain relevant and effective, the IC must take advantage of quantitative and computational methodology, especially in the military domain. Although standard in other knowledge-

⁹ See, for instance, the original guide to SATs, *A Tradecraft Primer: Structured Analytic Techniques for Improving Intelligence Analysis* (Washington, DC: Central Intelligence Agency, 2009); the expanded title by Randolph H. Pherson and Richards J. Heuer Jr., *Structured Analytic Techniques for Intelligence Analysis*, 3d ed. (Thousand Oaks, CA: CQ Press, an imprint of Sage, 2019); and for a sound overview, *Intelligence Analysis*, Army Techniques Publication 2-33.4 (Washington, DC: Department of the Army, 2020).

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oriented professions, including DOD and the Services, advanced quantitative and computational methods and tools are less familiar within the IC.¹⁰ The quantitative disciplines most applicable to defense intelligence analysis consist basically of statistics, probability, and operations research (OR), all of which subsume a vast array of methods and tools. These include everything from basic spatiotemporal plotting and calculation to Bayesian probability (named for Thomas Bayes), systems and process modeling, and Monte Carlo simulation. Simulation modeling includes technical systems modeling, network modeling, project management modeling, and comprehensive systems-of-systems modeling, including advanced complex adaptive systems techniques such as evolutionary algorithms and agent-based modeling. All of these come under the broad rubric of M&S, which uses statistics and probability and can be classified under OR.

Although M&S is well-established in scientific and technical intelligence, traditional IC capabilities, as found in general military intelligence (GMI), have not advanced to include formal modeling and simulation-based assessment, and the culture in fact resists any such advance.¹¹ And unfortunately, traditional DOD and Service M&S not only is hugely expensive; it is highly rigid and extensively prescribed, making it inappropriate to the wide-ranging exploratory requirements of intelligence discovery. Defense intelligence centers cannot simply import high-end DOD tools and techniques. They need their own intelligence-tailored quantitative analysis capability.

¹⁰ See, for instance, Rob Johnston, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study* (Washington, DC: Center for the Study of Intelligence, Central Intelligence Agency, 2005); and Jeffrey R. Cooper, *Curing Analytic Pathologies: Pathways to Improved Intelligence Analysis* (Washington, DC: Center for the Study of Intelligence, Central Intelligence Agency, 2005).

¹¹ For example, in a keyword search through any authoritative text on intelligence tradecraft, the seeker is unlikely to find results for scientific method, methodology, wargaming, modeling, simulation, M&S, stochastic, Bayes, or any variant of these or similar terms.

Getting There from Here

To develop this competence, the intelligence centers need to find an easier way to explore M&S and define their internal methodological and system requirements. Fortunately, an easy way is readily available: *wargaming*. One highly effective but inexpensive method for this is Naval War College-style manual wargaming using paper components on tabletop gameboards or even occasionally on the floor, as used to be done in McCarty Little Hall.¹² Commercial hobby wargamers have developed thousands of historical wargames that can, at negligible cost in money and time, be adapted to meet or support a wide range of internal capability development requirements, including:

1. **Modeling:** basic principles of systems and warfare modeling using aggregated systems characteristics and performance (S&T/C&P) data and unit/force order of battle and organizational data (OB/TO&E), all integrated through algorithms (i.e., rules, matrices) defining systems/unit behaviors and interactions;
2. **CTSA:** scenario- and simulation-based analytic projects provide a fertile environment for the deployment of today's advanced techniques, with special reference to the development of alternative red cell hypotheses. They also afford the opportunity to incorporate traditional military command and staff tools and techniques such as checklists and planning matrices and organize the entire team-collaborative process and product within the format of a five-paragraph operations order;
3. **Simulation:** experimental testing of multiple alternative hypotheses. Manual gaming can realistically test only a very few hypotheses compared to computational Monte Carlo simulation; however, it engages the

¹² The literature on U.S. Naval War College wargaming is extensive. See, for example, Peter P. Perla, *The Art of Wargaming* (Annapolis, MD: Naval Institute Press, 1990); and Shawn Burns, ed., *War Gamers' Handbook: A Guide for Professional War Gamers* (Newport, RI: Naval War College, 2015).

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entire analytic team in the action, providing a superb environment for training, familiarization, brainstorming, and reconceptualization. Manual wargaming can help shape scenarios for testing via computational M&S, which in turn can test many different variables and hypotheses through high-speed batch runs.

Commercial hobby and research board games are highly adaptable and applicable to both intelligence training and advanced analytic support requirements. Many games are historical, but a good number are available on modern and even future-hypothetical scenarios. Commercial computer games offer potential opportunities as well, but by design they are not typically manipulable or adaptable by users, limiting their utility. Moreover, few are designed to be used on local area networks, and all would pose IT challenges for information assurance and systems administration.

The SimBAT program encourages progress by small stages from today's world of individual analysts huddling alone at their desks using largely intuitive reasoning, through team-based brainstorming and CTSA, and then wargame-based simulation experimentation, toward a full-scale computational analytic capability. At this fully mature stage, team debating techniques and flipchart matrices will be supplemented by computational mathematical tools, while the board wargames will be complemented and completed through the use of computational warfare M&S.

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SimBAT Insight, Knowledge, and Discovery

As part of low-risk development, SimBAT commenced with training. The team conducts simulation-based training as a graduate seminar with a lab. The pedagogical philosophy emphasizes active, experiential, discovery learning, and the basic format consists of courses combining instruction and simulation. Extensive materials are developed for each phase.

Seminars are conducted through elicitation—the Socratic (dialogue) method of guided inquiry rather than lecture. This takes the form of facilitated brainstorming and structured analysis using predefined templates.

The lab, of course, is the wargame. For the instructors, it functions as a demonstration experiment; for the students, however, it provides an opportunity for exploration and discovery. The wargames follow the Naval War College (NWC) format. The instructors become controllers (the white cell), while the students divide into national teams (the blue and red cells), both of which perceive only those parts of the battlespace where they have assets and communications. Using the instructor-supplied background data and worksheets, which have been studied and filled out in the pregame seminar sessions, the teams formulate alternative hypotheses as to enemy capabilities and intentions and then develop an own-force operational plan (OPLAN) based on the assessed threat and expected enemy action. They then formulate all of this in a five-paragraph operations order (OPORD). Finally, they attempt to execute their plan and thwart that of the enemy in the wargame. The white cell subjects the teams to some of the fog and friction of real operations to convey the challenges of operational command and decision making under conditions of uncertainty and at least modest stress.

Fog, Friction, and Surprise:

Preparing Analysts for Crisis and War

One of the implicit learning objectives intelligence education should address is the very real threat of surprise. History is a litany of contingency and unforeseen consequences. Intelligence failure and policy/strategy misjudgment (based on misperception and/or misconception and poor collection, analysis, and decision) is a common occurrence, and catastrophic national security consequences occasionally follow. Recent research demonstrates the extent of judgmental overconfidence

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among analysts and decision-makers, and hence susceptibility to deception and vulnerability to surprise.¹³

Traditional pedagogy contributes to this judgmental overconfidence, leaving students and graduates cognitively disarmed for the challenges of intelligence and war. Deskbound “chalk and talk” education and the social order of the schoolhouse and classroom inculcate in students a belief system built around an image of people as truthful and cooperative and the world as orderly, knowable, and controllable. Routine intelligence deskwork and current reporting do little to counteract this complacent worldview, and thus provide poor preparation for analysts charged with anticipating and warning of emergent threats posed by adversaries who can exploit deception, maneuver, and unexpected American vulnerabilities.¹⁴

Simulation, by contrast, and especially historical simulation, provides a superb training laboratory for experiencing the unexpected. Player teams often form conflicting images and definitions of the situation, especially under NWC conditions in which the belligerent teams huddle in separate rooms. Adversary gambits seek to exploit vulnerabilities. White cell injects intelligence of mixed quality and timeliness (fog) and of command and control vicissitudes (friction) that disrupt the pat image of a predictable world.

Historical simulation strengthens this teaching lesson. Most education conveys a teleological sense of history as determined and inevitable, reinforcing students’ sense of predictability in world affairs. In fact, however, historical events often turn on contingencies that could have gone the other way. This is especially true in naval affairs. Confederate army general Robert E. Lee might not have been able to win at Gettysburg, nor Adolf Hitler in Russia, but the outcomes of many naval en-

¹³ See Philip E. Tetlock, *Expert Political Judgment: How Good Is It? How Can We Know?* (Princeton, NJ: Princeton University Press, 2017).

¹⁴ See Johnston, *Analytic Culture*; and Cooper, *Curing Analytic Pathologies*.

gagements result from contingent and fleeting combinations that could more easily have gone the other way. Consider, for example, the stunning victory of the French admiral François-Joseph-Paul de Grasse over British admiral Thomas Graves at the Battle of the Chesapeake in 1781 that sealed the fate of Charles Cornwallis at Yorktown and thereby ensured the independence of the American colonies, and the temporary disarray in the Japanese carrier force at Midway that enabled the Americans to inflict sudden, catastrophic damage. Wargaming exposes participants to these unexpected outcomes. Intelligence analysts, and especially naval intelligence analysts, therefore need the kind of preparation for unexpected emergencies and sharp shifts in fortune that only fog-and-friction-riven simulation can provide.

Team Bonding, Morale, and Retention

This assault on junior analysts' comfortable image of life and the world, however, induces a certain level of stress. Simulation confronts them simultaneously with uncertainty and with perceived stakes for judgmental error. It does so in the lab, however, not in the National Military Command Center, Combatant Commands, Joint Task Force Headquarters, or afloat staff, where the consequences are far more severe. Student stress is real but manageable. And, as military trainers have known for centuries and modern pedagogical theory has rediscovered, moderate stress can intensify learning while forging interpersonal and institutional bonds—morale and *esprit de corps*.

Simulation seminars are designed to contribute to this organizational objective. The social dynamics of team-based wargaming involve both collaboration and competition. Ego and emotions engage. Participants long remember these experiences. They feel challenged individually while they bond collectively. Extensive exposure to simulation training across the analytic workforce could build a culture of unity and cohesion

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across the command, potentially contributing to improved retention in the long term.

Analytic Standards and Methodological/ Pedagogical Model

Armed Services have known for centuries the pedagogical power of combined schoolhouse and exercise-based training, whether the exercises be tactical problems, NWC wargames, command-post exercises, or full-scale field and fleet exercises.¹⁵ The simulation seminar brings that pedagogical power to ONI.

Being experiential education, however, the program teaches cumulatively: it is as much enculturation and indoctrination as it is instruction. It both builds an analytic culture (integrated set of beliefs, values, principles, and practices for intelligence production), and socializes analysts into that culture—a process that can succeed only cumulatively. Each individual course, typically two to five days in length, contributes to a broader campaign to enhance the expertise of the analytic workforce.

Each course provides great breadth of exposure to concepts, principles, and practices. Each exposes the trainee teams to the full range of command staff data analysis, assessment, and decision making concerning the operational theater, the enemy, and their country/force, involving both capabilities and intentions and enemy course-of-action assessment. It is an immersion and experiential overload that is challenging, even stressful and perhaps somewhat frustrating (especially first-time exposures for complete novices). What the trainees take away is a highly memorable orientation toward the military operational problem domain and the command staff solution (intelligence, planning, and decision making).

Simulation participants typically remember the experi-

¹⁵ See, for instance, Perla, *Art of Wargaming*.

ence, especially when their role requires publicly visible leadership or decision making that then is tested and succeeds or fails. Though it all might seem chaotic while immersed, multiple high-intensity exposures deepen the trainees' understanding of the fundamentals of warfare and intelligence, especially for operating in the *wartime* arena.

Cognitive Diversity and Thinking/Learning Styles

Simulation and lab-based education in general help meet the needs of diverse cognitive and learning styles across typical student populations. Two schools contend in educational theory: one argues that human cognitive development progresses up universal developmental stages and the other contends that humans vary by personality and cognitive profile. The stage model is associated with Swiss psychologist Jean Piaget, whose schema and clinical studies track students (children, specifically, where most educational research naturally focuses) along stages from physical and emotional development to cognitive and intellectual.¹⁶

The adolescent and adult cognitive modes are “concrete and formal operations.” Individuals in the concrete operational stage reason rationally but narrowly, focusing closely on factual empirical data and current events. The skills they lack are those associated with full development into formal operations: the ability and tendency to generalize and abstract from observed data, seek and recognize universals, and theorize, exploiting the power of counterfactual (hypothetical) reasoning. Formal operators have well-developed pattern recognition skills, including trend detection, and as such they can and do extrapolate, hypothesize, and predict.¹⁷

The human variability model is associated with personality

¹⁶ See, for instance, one treatment within a vast literature, by Rodger W. Bybee and Robert B. Sund, *Piaget for Educators*, 2d ed. (Columbus, OH: Charles E. Merrill Publishing, 1972/1986).

¹⁷ Bybee and Sund, *Piaget for Educators*.

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theory and cognitive psychology. It holds that humans differ in their cognitive aptitudes as they progress developmentally, and that these traits tend to persist throughout life.¹⁸

The two most well-known personality models are the Myers-Briggs inventory and the academic Five-Factor Model (FFM, a.k.a. Big Five Personality Traits). The Myers-Briggs Type Indicator's (MBTI) power for understanding "knowledge workers" lies in its focus on perceptual-cognitive traits, while the FFM is more of a generic personality inventory. The MBTI distinguishes 16 personality types, each of which possesses particular perceptual, cognitive, and practical strengths and weaknesses.¹⁹ The FFM is similar and, although currently less well-tailored to support pedagogical design, is the subject of extensive research. The MBTI differentiates personality types across four binary character oppositions:

1. Extroverted (E) *versus* introverted (I) (self-explanatory);
2. Intuitive (N) *versus* sensory (S) (formal versus concrete, à la Piaget above);
3. Thinking (T) *versus* feeling (F) (cognitive versus emotional); and
4. Judging (J) *versus* perceiving (P) (convergent/conclusive versus divergent/open).

Individuals vary also in their learning styles and modes of processing information—note that learning is not just what knowledge workers do in training; it is what they do for a living: acquire and develop new knowledge, with intelligence analysis and production being a form of learning. In his Experiential Learning Theory (ELT), David A. Kolb has developed a model

¹⁸ For an overview, see Thomas J. Smith et al., *Variability in Human Performance* (Boca Raton, FL: CRC Press, an imprint of Taylor & Francis, 2015).

¹⁹ The Myers-Briggs website is a convenient source for an overview and to take the inventory. Isabel Briggs Myers et al., *MBTI Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*, 3d ed. (Palo Alto, CA: Consulting Psychologists Press, 1998).

of learning styles highly consistent with Piaget and the MBTI, which postulates the following orientations:²⁰

1. Methods of grasping experience:

- Concrete experience;
- Abstract conceptualization;

2. Methods of transforming experience:

- Reflective observation;
- Active experimentation.

Combining Piaget and Kolb in alignment with principles from analytic methodology suggests the relationship depicted in the following matrix, producing four learning styles in two binary pairs: divergent versus convergent and assimilating versus accommodating (table 3).²¹

Kolb's resulting experiential learning theory (ELT) argues that the optimal pedagogical method engages all four of these cognitive modes.²²

The concept of cognitive variability has been applied to pedagogical theory in recent years, such as that by Howard Gardner and Mel Levine. Their very similar schemata, multiple intelligences (Gardner) and neurodevelopmental systems (Levine), differentiate individual cognitive traits in ways that appear highly applicable to professional education, especial-

²⁰ David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Upper Saddle River, NJ: Prentiss-Hall, 1984), chap. 2.

²¹ Assimilation and accommodation are also Piagetian concepts. *Assimilation* refers to the tendency to perceive incoming information as consistent with extant beliefs. *Accommodation* refers to a tendency to change beliefs based on new data. See Bybee and Sund, *Piaget for Educators*. This issue is critical for intelligence assessment and is the core question in modern cognitive psychology, as distilled by Richards J. Heuer Jr., *Psychology of Intelligence Analysis* (Washington, DC: Center for the Study of Intelligence, Central Intelligence Agency, 1999). Heuer's analysis of competing hypotheses and related decision-theoretic tools and techniques are designed in great part to help analysts choose between assimilation and accommodation.

²² Other learning style models exist as well. See Frank Romanelli, Eleanora Bird, and Melody Ryan, "Learning Styles: A Review of Theory, Application, and Best Practices," *American Journal of Pharmaceutical Education*, 73, no. 1 (2009): 9, <https://doi.org/10.5688/aj730109>.

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Table 3. Learning styles framework for SimBAT

Kolb's learning styles	Concrete experience	Abstract conceptualization
Reflective observation	Divergent	Assimilation
Active experimentation	Accommodation	Convergent

Source: adapted from David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (Upper Saddle River, NJ: Prentiss-Hall, 1984); and Rodger W. Bybee and Robert B. Sund, *Piaget for Educators*, 2d ed. (Columbus. OH: Charles E. Merrill Publishing, 1972/1986).

Table 4. Multiple intelligences/neurodevelopmental systems

Levine's neurodevelopmental systems							
Attention control	Memory	Language	Motor	Spatial ordering	Sequential ordering	Higher thinking	Social thinking
Gardner's multiple intelligences							
---	---	Linguistic	Bodily kinesthetic	Spatial	Musical	Logic-math	Interpersonal

Source: Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983); and Mel Levine, *A Mind at a Time* (New York: Simon & Schuster, 2002).

ly that of knowledge workers (table 4).²³ They also incorporate the noncognitive modes of experience and learning that often form the implicit, latent, or subconscious but emotionally and behaviorally important substratum that lays the foundations for success in the explicit, manifest element, thus achieving the instructional learning objectives.

Finally, individuals vary in their perceptual learning styles.

²³ Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences* (New York: Basic Books, 1983); and Mel Levine, *A Mind at a Time* (New York: Simon & Schuster, 2002).

Table 5. Strengths of traditional DOD/IC schoolhouse education and training compared with simulation-based training
 DOD/IC curriculum: teaches the what
 SimBAT: fosters discovery of the how and why

Knowledge, skills, and abilities	Facts, regional and functional		
Educational programs	Regional facts (area familiarization)	Functional facts (disciplinary familiarization)	History
DOD/IC curriculum	✓	✓	✓
SimBAT			✓

Source: author's assessment.

The oft-cited VARK schema delineates four preferences:²⁴

1. Visual;
2. Auditory;
3. Reading/writing; and
4. Kinesthetic/tactile.

Broadly speaking, human learning, reasoning, and problem-solving involve a range of different traits and aptitudes, some more or less optimal for productive, insightful analytico-synthetic knowledge acquisition and creation, but all being present in greater or lesser proportion across the analytic workforce (table 5). To summarize, analyst-learner aptitudes and preferences range across the following dimensions:

²⁴ See "VARK: A Guide to Learning Preferences," VARK-Learn.com, accessed 24 January 2022.

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Methodology: command-staff process (intelligence and operations)

Conceptual and critical thinking (analysis/logic)	Situation assessment	Creative thinking (imagination, synthesis)	Problem solving and decision making	Team collaboration and problem solving	Persuasive argumentation
√	√	√	√	√	√

1. Cognitive:

Abstract	<i>versus</i>	concrete;
Conceptual	<i>versus</i>	factual;
Theoretical	<i>versus</i>	experiential/experimental;
Intellectual	<i>versus</i>	emotional;

2. Sensory:

Visual, auditory, or tactile.

This variability demands what in modern business theory is known as mass customization, the ability to meet variable demand with a single multidimensional family of products or services.²⁵ Simulation-based training meets this need by combining four basic pedagogical modes:

²⁵ See for instance B. Joseph Pine II, *Mass Customization: The New Frontier in Business Competition* (Boston, MA: Harvard Business School Press, 1993).

1. Classroom and study:

- Readings/study materials;
- Lecture/briefings;

2. Lab and exercises:

- Elicitation and structured brainstorming using templates;
- Simulation gaming (lab experimentation).

This combination is designed to help diverse students progress from concrete to formal operational skills and aptitudes, whatever their cognitive tastes and learning styles. An implementation overview is provided below; individual courses are detailed in their associated course guides and syllabi. Table 5 compares the strengths of traditional school-house education with multidimensional simulation-based education.

Integration with Intelligence Analytic Career-Development

Reform based on the principles advocated above should proceed in complementary interdependence with the existing program of analyst career development. Current training and development consist of day-to-day job experience (reading and writing factual, peacetime intelligence reports), the prescribed analytic progression along the agency/community curriculum, and the IC's interagency Analysis 101 and Intelligence Community Advanced Analysis Program (ICAAP) curricula, as well as deception analysis, asymmetric warfare, and other courses. Much of the associated instruction in structured analytic techniques is generic, using examples in political intelligence, law enforcement, the war on terrorism, money laundering, noncombatant evacuation operations (NEOs), human intelligence source evaluations, etc. Many exercises are lifted from critical thinking texts unrelated to military problems. Military examples are relatively rare and naval ones even rarer.

ONI-based maritime mission-tailored simulation instruction is designed both to prepare analysts to master the IC's

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CTSA curriculum, priming their cognitive readiness to extract maximum value from the coursework, and to then apply CTSA directly to ONI's functional responsibilities in intelligence production. Within the ONI in-house program, maritime and naval examples are used primarily, both sea chases for operational intelligence watch and civil maritime training, and wars, campaigns and battles for general military intelligence (GMI) training. And again, the classic military command-and-staff CTSA analysis and planning techniques are introduced.

By bridging the gap between the analyst's career development and ONI's mission area, this in-house training program provides maximal learning transfer in both directions between the schoolhouse and the workstation.

Integration with the IC and ONI Analytic Standards

The command staff process enacted in simulation seminars drills analyst trainees in the step-by-step implementation of the checklists specified in IC analytic tradecraft.

At the same time, the Office of the Director of National Intelligence (ODNI) has promulgated guidance on analytic tradecraft.²⁶ The simulation seminar program maps directly to these standards and to the structured analytic techniques that implement them, as shown in tables 6–9.

These tables demonstrate how the analytic quality standards promulgated in *ICD 203* and ONI's analytic tradecraft instruction can be implemented through structured analytic techniques and simulation-based training. In fact, full-scale development of simulation courses should afford enough scripted intelligence feed to support the incorporation of these structured techniques directly into team decision making in the simulations.

²⁶ *Intelligence Community Directive (ICD) 203, "Analytic Standards"* (Washington, DC: Office of the Director of National Intelligence, 21 June 2007).

Table 6. *Intelligence Community Directive 203, “Analytic Standards”*

1.	Objectivity
2.	Political independence
3.	Timeliness
4.	Based on all sources of intelligence
5.	Proper standards of analytic tradecraft:
a.	Properly describes quality and reliability of underlying sources;
b.	Properly caveats and expresses uncertainties or confidence in analytic judgments;
c.	Properly distinguishes between underlying intelligence and analysts’ assumptions and judgments;
d.	Incorporates alternative analysis where appropriate;
e.	Demonstrates relevance to U.S. national security;
f.	Uses logical argumentation;
g.	Exhibits consistency of analysis over time, or highlights changes and explains rationale; and
h.	Makes accurate judgments and assessments.

Source: adapted from *Intelligence Community Directive (ICD) 203, “Analytic Standards”* (Washington, DC: Office of the Director of National Intelligence, 21 June 2007), 2–3.

Analytic Capabilities and Learning Objectives

Organizational-Developmental and Educational Purpose:

Strategic Learning Objectives

Beyond training analysts in individual skills, the simulation seminar program is designed to foster a multiplier effect across the organization as more students are run through multiple courses. As such, it is intended to serve as a program of *organizational learning* for the purposes of organizational development and business process reengineering in analytic methodology.

These organizational and individual developmental objectives can be summarized as follows:

For the command:

- Provide organizational learning/development that fosters methodological modernization, specifically in the development and application of cognitive collaboration and eventually computational collaboration.

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Table 7. Standard Intelligence Community Structured Analytic Techniques

Diagnostic techniques:

1. Key assumptions check
2. Quality-of-information check
3. Indicators of change
4. Deception check
5. Analysis of competing hypotheses (ACH)

Imagination techniques:

1. Brainstorming
2. Outside-in
3. Red team
4. Alternative futures (multiple scenarios)

Contrarian (reframing) techniques:

1. Devil's advocacy
 2. Team A/team B
 3. High-impact/low-probability
 4. What if
 5. Quadrant crunching
-

Source: *A Tradecraft Primer: Structured Analytic Techniques for Improving Intelligence Analysis*, Tradecraft Review, vol. 2, no. 2 (Langley, VA: Central Intelligence Agency, 2005).

For students:

- Inculcate student analysts in fundamental principles of war, seapower, command decision making, and intelligence analysis, while instilling the associated cognitive and behavioral skills and abilities;
- Build instruction around the fundamentals of naval warfare, command and staff processes, warfighting capabilities and intentions, and critical thinking and structured analysis (CTSA); and
- Prepare analysts for CTSA coursework in intelligence community schoolhouses, and provide naval warfighting exemplification and application of the standard curriculum of CTSA concepts and techniques.

For instructor/facilitators:

- Provide instructors/facilitators (analysts and managers) experience in the design, planning, coordination,

Table 8. Mapping: Implementation of *Intelligence Community Directive (ICD) 203, "Analytic Standards"* via Structured Analytic Techniques

ICD 203, "Analytic Standards"	Structured Analytic Techniques
1. Objectivity 2. Political independence	Contrarian techniques 1 and 2: devil's advocacy and team A/team B
3. Timeliness	<i>(not applicable: unlike interactive wargames, scenario exercises will not exercise time-critical intelligence cycling)</i>
4. Exploitation of all sources of intelligence	Imagination technique 1: brainstorming
5. Proper standards of analytic tradecraft:	Promoted by:
5.1. Properly describe quality and reliability of underlying sources	Diagnostic techniques 2 and 3: quality-of-information check and deception check Contrarian technique 1: devil's advocacy
5.2. Properly caveat and express uncertainties or confidence in analytic judgments	Diagnostic techniques 1 and 3: key assumptions check and deception check Contrarian technique 1: devil's advocacy
5.3. Properly distinguish between underlying intelligence and analysts' assumptions and judgments	Diagnostic techniques 1, 2, and 3: key assumptions check, quality-of-information check, and deception check Contrarian technique 1: devil's advocacy
5.4. Incorporate alternative analysis where appropriate	Diagnostic techniques 1–5: key assumptions check, quality-of-information check, indicators of change, deception check, analysis of competing hypotheses (ACH) Contrarian techniques 1–5: devil's advocacy, team A/team B, high-impact/low-probability, what if, and quadrant crunching Imagination techniques 1–4: brainstorming, outside-in, red team, alternative futures
5.5. Demonstrate relevance to U.S. national security	<i>(Exercises will train analysts to understand warfare and military threats and perform analytic work that supports U.S. national security.)</i>

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Table 8. Mapping: Implementation of *Intelligence Community Directive (ICD) 203, “Analytic Standards”* via Structured Analytic Techniques (continued)

<i>ICD 203, “Analytic Standards”</i>	Structured Analytic Techniques
5.6. Use logical argumentation	ODNI-endorsed technique: argument mapping (<i>Facilitated collaboration and structured analysis in general will tend to promote logical reasoning and expose bias/fallacies.</i>)
5.7. Exhibit consistency of analysis over time or highlight changes and explain rationale	Diagnostic techniques 1–5: key assumptions check, quality-of-information check, indicators of change, deception check, and ACH
5.8. Make accurate judgments and assessments	(<i>Facilitated collaboration and structured analysis in general will tend to promote valid, accurate judgment and assessment.</i>)

Source: adapted from *Intelligence Community Directive (ICD) 203, “Analytic Standards”* (Washington, DC: Office of the Director of National Intelligence, 21 June 2007); and *A Tradecraft Primer: Structured Analytic Techniques for Improving Intelligence Analysis*, Tradecraft Review vol. 2, no. 2 (Langley, VA: Central Intelligence Agency, 2005).

and implementation of projects, with special reference to training courses and analytic-support projects that result in intelligence discovery, new findings, and new production.

SimBAT Organizational and Individual Learning Program: Specific Learning Objectives

Since warfare simulation exposes analysts/students to the full range of operational and planning variables, the range of supported learning objectives is vast. Table 9 (and the following chapter addendum) lists these with text boxes on the right that specify seminar and/or simulation activities that fulfill the objectives.

At the same time, participating in the development and execution of simulation seminars offers career-enhancing training benefits to participating instructor/facilitators (table 10).

Table 9. Simulation-based analysis and training learning objectives

I. Substantive principles and practices/KSAs
I.1. Strategy, doctrine, capabilities, and operations
I.1.1. Strategic requirements of different belligerent powers/postures;
I.1.2. Principles of war
I.1.3. Naval roles and missions
I.1.4. Principles, roles, and missions associated with different strategic postures
I.1.5. Operational capabilities required for different principles, roles, and missions
I.1.6. Force/units types associated with different capabilities
I.1.7. Basic principles of operational doctrine and tactics
I.2. Systems, tactics, and operations
I.2.1. Interpreting technical data: characteristics, performance, and tactical capabilities
I.2.2. Tactical doctrine
I.2.3. Operational implications of tactical capabilities
I.2.4. Operational doctrine
II. Methodological principles and practices
II.1. Command and staff: intelligence, decision making, and planning
II.1.1. Intelligence operations
II.1.1.1. Threat of surprise
II.1.1.2. Intentions, alternative hypotheses/courses of action (COAs)
II.1.1.3. Capabilities, alternative hypotheses
II.1.1.4. Collection: I&W, essential elements of information (EIs), and collection planning
II.1.1.5. Assessment: threats/opportunities; CTSA (e.g., ACH)
II.1.2. Command: operational decision and planning
II.1.2.1. Operational planning, alternative options/COAs: principles of war; roles/missions; phasing; plotting
II.1.2.2. Force organization, orders of battle and tables of organization and equipment (OB/TO&E)

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Table 9. Simulation-based analysis and training learning objectives
(continued)

II.1.2.3. Command, control, and communications
II.1.2.4. Logistics and supply
II.1.2.5. Operations order (5-paragraph OPORD)
II.1.3. Command: execution and adaptation
II.1.2.1. Command, control, communications, computers and intelligence, surveillance, and reconnaissance (C4ISR) cycle (i.e., the observation, orientation, decision, and action [OODA] loop)
II.1.2.2. Contingency response (recover, adapt, exploit)
II.2. Cognitive reasoning (critico-creative thinking)
II.2.1. Situation, threat, and net assessment (Critical Thinking and Structured Analysis)
II.2.1.1. Inductive synthesis: data collation; data comparison/evaluation; CTSA: matrices, timelines, network diagrams; generation, multiple alternative hypotheses.
II.2.1.2. Deductive analysis
<ul style="list-style-type: none">• Deduction of hypotheses probable or necessary correlates: Prerequisites; Implications; diagnostic observables (indicators)• CTSA: key assumptions checks (checklists, matrices), analysis of competing hypotheses (ACH), etc.
II.2.1.3. Integrative synthesis
<ul style="list-style-type: none">• Elimination of least plausible hypotheses• Elaboration of most plausible• Comprehensive scenario development
II.2.2. Decision making/planning
II.2.2.1. Alternative options
<ul style="list-style-type: none">• Ends versus means• Threat versus opportunity
II.2.2.2. Selection of best
<ul style="list-style-type: none">• Multiple competing objectives• Expected utility/optimization• Decision

Table 9. Simulation-based analysis and training learning objectives
(continued)

• Decision
II.2.2.1. Cognitive processes
• Judgment/decision making under uncertainty
• Cognitive virtues
• Incisiveness; prudence; boldness; imagination; creativity; decisiveness
II.2.3. Staff process
II.2.3.1. Leadership
• Authority/influence
• Decision making
II.2.3.2. Teamwork
• Collaboration
• Team self-organization
II.2.3.3. Management
• Time management
• Stress management
• Execution
II.3. Scientific methodology (quantitative and computational analysis)
II.3.1. Modeling
• Structural architectures: objects, properties, networks (quantification of military capabilities);
• Functional processes: relationships, causal algorithms, probability;
II.3.2. Simulation
• Experimental design: hypothesis formulation, scenarios, variables, excursions;
• Hypothesis-testing: Monte Carlo randomization, sensitivity analysis, analysis of experimental results.

Source: author's pedagogical design for SimBAT.

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Table 10. Learning objectives for instructor/facilitators

II. Leadership and management
III.1. Preparation and planning
III.1.1. Course design
III.1.1.1. Learning objectives
III.1.1.2. Syllabus
III.1.1.3. Agenda
III.1.1.4. Selection of conflict scenario for case study
III.1.1.5. Selection of simulation game (e.g., commercial hobby wargame)
III.1.1.6. Design of scenario exercise when COTS product unavailable
III.1.2. Instructional materials
III.1.2.1. Design adaptation of wargame(s)
III.1.2.2. Graphics/photographic reproduction of materials (if needed)
III.1.2.3. Development of templates (tables, charts, and checklists for facilitation/structured analysis)
III.1.2.4. Preparation of additional background materials (readings and reference data, evaluation forms)
III.1.3. Command participation
III.1.3.1. Eliciting support from ONI managers
III.1.3.2. Eliciting participation by ONI analysts/students
III.2. Implementation
III.2.1. Event management
III.2.1.1. Leadership of white cell
III.2.1.2. Leadership of students
III.2.1.3. Time management
III.2.1.4. Maintenance of the objective(s)
III.2.1.5. Maintenance of morale
III.2.2. Instruction
III.2.2.1. Facilitation/elicitation (Socratic method)
III.2.2.2. Student participation
III.2.2.3. Balance (objectives versus time)

Table 10. Learning objectives for instructor/facilitators (continued)

I. Lessons, reports, and program development
IV.1. Evaluation, lessons, and action
IV.1.1. Evaluations
IV.1.1.1. Design of the student course evaluation form (mapped to learning objectives)
IV.1.1.2. Distribution
IV.1.1.3. Agenda
IV.1.1.4. Elicitation of participant submission of course evaluations
IV.1.1.5. Collation of findings
IV.1.2. Program improvement
IV.1.2.1. Lessons learned
IV.1.2.2. Design of program improvements
IV.1.2.3. Implementation
IV.2. Reports to management
IV.2.1. Reports
IV.2.1.1. Drafting of report
IV.2.1.2. Development of brief
IV.2.2. Presentation
IV.2.2.1. Dissemination of report
IV.2.2.2. Presentation of brief

Source: author's pedagogical design for SimBAT.

Chapter Three Addendum

SimBAT Introductory Course

Syllabus and Materials

SimBAT courses provide command and staff in miniature. They consist of a variable number of students whom the instructor leads through a standard staff planning session in which the students perform intelligence preparation of the battlespace (IPB) and implement the military decision-making process (MDMP). Joint Chiefs of Staff publications provide doctrinal guidance.¹

The format and layout follow the basic concept of U.S. Naval War College (USNWC) wargaming. We divide the students into blue and red cells, with the instructor, game master, and event adjudicator forming the white cell (in the introductory course, this is a cell of one). The instructor or an expert colleague briefs on the subject matter, event, or era under examination and then the instructor facilitates team brainstorming as they lead the blue and red cells through a series of IPB/MDMP exercises in which the teams reason through and fill out structured analytic templates (SATs). These typically are matrices, although white boards are available for flow-diagramming during course-of-action (COA) analysis.

This appendix provides an annotated guide to this introductory course.

¹ *Joint Planning*, Joint Publication (JP) 5-0 (Washington, DC: Joint Chiefs of Staff, 2020); *Joint Intelligence*, JP 2-0 (Washington, DC: Joint Chiefs of Staff, 2013); and *Joint Operations*, JP 3-0 (Washington, DC: Joint Chiefs of Staff, 2018).

CHAPTER THREE ADDENDUM

Simulation-Based Analysis and Training Course
Introduction to Global Strategy
2-Day Course

Intelligence analysis, strategic planning and execution in a simulated conflict:

Global Strategy in World War II

Format:

- Collaborative student teams (red cell/blue cell) supported by instructor team (white cell);
- Briefing on intelligence preparation of the battlespace (IPB) and the military decision-making process (MDMP);
- Team exercise: intelligence and ops planning: strategic analysis, alternative hypotheses and predictive forecasting in support of force-structure and campaign planning, providing insight into adversary decision-makers and the U.S. national-level customer;
- Simulation exercise: student teams test their intelligence hypotheses and execute their ops plans;
- Critical Thinking and Structured Analysis (CTSA): students will be trained in structured analysis using specifically military analytic templates (matrices, checklists, plotting charts);
- Learning objectives, syllabus, and agenda detailed below.

RohM Production Costs	Land Warfare				Naval Warfare				Air Warfare				Multi- Mission Combat Value			
	Offensive Combat Value	Defensive Combat Value	Ratio (Off: Def)	Strat Value	Avg Combat Value	Offensive Combat Value	Defensive Combat Value	Ratio (Off: Def)	Strat Value	Avg Combat Value	Offensive Combat Value	Defensive Combat Value		Ratio (Off: Def)	Strat Value	Avg Combat Value
Army																
Armor																
Infantry																
Art'y																
Air Force																
Embarq																
TacAir																
Navy																
CVs																
CAOs																
SSs																
CACs																
DCs																
SSs																
Litt																

SIMBAT INTRODUCTORY COURSE

LEARNING OBJECTIVES: INTRODUCTION TO GLOBAL STRATEGY

Knowledge areas	This course will introduce entry-level analysts to basic concepts, principles, and practices in the following analytic skills and disciplines
I. Principles	
1. National-level strategy	Students will be introduced to basic concepts of military strategy and planning. Course will examine the European theater of operations in World War II.
2. Roles and missions: sea, air, land	Students will compare the relative strengths and weaknesses of land, sea, and air forces with regard to offense, defense, surprise, mass, and stability as they plan and employ their forces within the simulation.
II. Military forces and operations	
1. Capabilities and operations: sea, air, land	Students will be introduced to the comparative evaluation (costs/benefits) of force types and capabilities as they build and employ theater-level forces.
2. Modeling and quantitative evaluation	Students will explore the simple warfare model embedded in this simulation as they evaluate the costs versus capabilities of military forces in alternative roles/missions.
III. Methodology for intelligence and military decision making	
1. Team collaboration	Students will utilize team analysis processes and collaborative problem-solving.
2. Situation assessment and planning	Students will be introduced to the staff planning/military decision-making process (MDMP), including IPB and threat and net assessment.
• CTSA: Critical Thinking/Structured Analysis	Students will learn to use military CTSA tools (IPB/MDMP decision aids) in analysis and planning.
• Intelligence preparation of the battlespace (IPB)	Students will be introduced to basic concepts, principles, and practices of estimative strategic projection.

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<ul style="list-style-type: none"> · Alternative intelligence hypotheses 	Students will learn how to generate, describe, and plot alternative enemy COAs.
3. Threat/net assessment	Students will learn how to compare and assess the relative strengths and weaknesses of contending forces and assess the overall correlation of forces relative to strategic and operational mission requirements.
4. Campaign planning	The students will learn how to develop COAs and a phased campaign plan based on strategic requirements, their net assessment, and the unfolding strategic situation.
5. Force structure planning	Students will design and build forces optimized for the strategic objectives and plans they devise.

COURSE SYLLABUS: LEARNING OBJECTIVES AND TRAINING ACTIVITIES

Day one	Syllabus	Learning objectives
Morning (0800–1130)	0800–0830: Course orientation	(Foundation for all LOs)
	0840–0940: Staff exercise: <ul style="list-style-type: none"> · Intelligence analysis and assessment · Strategic situation and net assessment 0950–1130: Staff exercise: Strategic campaign and force structure planning	I. Principles: 1. National strategy; 2. Roles and missions, sea, air, land; II. Military forces and operations: 1. Capabilities and operations: sea, air, land; III. Intelligence analysis/military decision making: 1. Team collaboration, 2. Situation assessment and planning, 3. Net assessment, 4. Campaign planning, 5. Force structure planning.

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Afternoon (1200–1600)	Theater strategic simulation wargame: European theater of operations, 1941–45	<p>I. Principles:</p> <ol style="list-style-type: none"> 1. National strategy; 2. Roles and missions, sea, air, land; <p>II. Military forces and operations:</p> <ol style="list-style-type: none"> 1. Capabilities and operations: sea, air, land; <p>III. Intelligence analysis/military decision making:</p> <ol style="list-style-type: none"> 1. Team collaboration, 2. Situation assessment and planning. 3. Net assessment, 4. Campaign planning, 5. Force structure planning.
Day Two	Syllabus	Learning objectives
Morning (0800–1230)	Theater strategic simulation wargame: European theater of operations, 1941–45	(as above)
Afternoon (1330–1530)	After action review (facilitated team discussion)	AAR will consummate all learning objectives.

CHAPTER THREE ADDENDUM

Cornerstone Module
**Simulation-Based Analysis and Training
 (SimBAT) Course:**

*Introduction to Global Strategy
 Course Guide*

ORDER-OF-BATTLE INTELLIGENCE TABLE

	German	Japan	Soviet Union	Great Britain	United States
Army					
Armor					
Infantry					
Artillery					
Air Force					
Bombers					
Fighters (TACAir)					
Navy					
Aircraft carriers					
Carrier air					
Battleships					
Cruisers					
Destroyers					
Submarines					
Transports					

SIMBAT INTRODUCTORY COURSE

STRATEGIC PLANNING CHECKLIST

National Power of the Belligerents (starting strengths):

What country has the strongest army? _____

What country has the strongest air force? _____

What country has the strongest navy? _____

What country is militarily the strongest? _____

What countries have the largest economies? _____

Do the Axis or the Allies have greater military power? _____

Do the Axis or the Allies have greater economic power? _____

Strategic Implications:

What is the Axis's greatest strategic advantage? _____

What is the Axis's greatest strategic disadvantage? _____

How can the Axis employ their advantages and negate those of the Allies? _____

What is the Allies' greatest strategic advantage? _____

What is the Allies' greatest strategic disadvantage? _____

How can the Allies employ their advantages and negate those of the Axis? _____

CHAPTER THREE ADDENDUM

AXIS AND ALLIES 1940

UNIT COSTS AND CAPABILITIES TABLE (V4)

Weapons systems costs and capabilities		Cost	Movement	Combat	
				Offense	Defense
Ground	Infantry	3	1	1(2) ^{CB}	2
	Mechanized infantry	4	2	1(2) ^{CB,B}	2
	Artillery	4	1	2 ^{CC}	2
	Armor	6	2	3 ^{CC}	3
Naval	Aircraft carriers	16	3+1 ^N	0	2
	Battleships	20	3+1 ^N	4	4
	Cruisers	12	3+1 ^N	3	3
	Destroyers	8	3+1 ^N	2 ^{CC}	2
	Submarines	6	2	2 ^S	1
	Transports	7	2	0 ^S	0
Air*	Strategic bombers	12	7 ¹ /10 ² /14 ⁵	4 ^{CB,S}	1
	Tactical bombers	11	6	3 ^{CB}	3
	Fighters	10	5 ³ /6 ⁴ /10 ⁵	3 ^{CB}	4
Strategic	AAA	6	1	0	1
	Major factory	30	--	--	(1) ^{AA}
	Minor factory	12	--	--	(1) ^{AA}
	Naval base	15	--	--	(1) ^{AA}
	Airbase	10	--	--	(1) ^{AA}

Notes:

CC: combined-arms contributor; see combined-arms table.

CB: combined-arms beneficiary; see combined-arms table.

B: can blitz with armor.

AA: organic AAA.

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N: naval maneuver: three zones in combat move plus one in admin move, even for units that already moved/fought.

S: special capabilities: sub surprise attack/evasion; transports and amphibious lift/assault; strategic bombing (check A&A rules).

Air movement and combat: see aviation at sea movement-point modifications, below.

1. Junkers Ju-88s (note: Germans get two free airbases at the outset).
2. Japanese, RAF, and USAAF bombers.
3. European fighters (non-Japanese, non-U.S.).
4. U.S. fighters (e.g., Lockheed P-38 Lightnings/Republic P-47 Thunderbolts, Grumman F6F Hellcats) other than the North American P-51 Mustang.
5. Extended-range fighters and strategic bombers: Mitsubishi A6M Zeros, P-51s, and Boeing B-29 Superfortresses (late war: turn six or so). (Note: need to adapt U.S. miniatures; e.g., using silver spray paint).

Naval Forces: Rules Modifications

- As noted above, all surface ships can move in the noncombat move phase even after having conducted combat (e.g., two-three sea zones out [with/without major base], then two back [or farther on]). This makes them more like aircraft.
- Submarine interdiction: subs can attack, but not impede the further movement of passing enemy naval units.
- Submarine evasion: subs can be attacked only by DDs, and may, after the first die roll(s) by the attacking DD(s), declare evasion and, forfeiting the option to return fire, break off contact. This applies when subs are attacked; when subs are attacking, they use the normal A&A sub rules.
- Heavy unit damage: CVs/BBs that take damage suffer reduced combat capabilities: BBs fire at two vice four, and CVs must suspend flight operations (air wing recovers aboard but cannot launch again).

Aviation at Sea: Rules Modifications

- Sea zones cost two MPs for aircraft to enter;
- Land-based aircraft pay two to enter sea zones adjacent to or surrounding their point of origin and one to enter a destination landmass from a sea zone;
- Carrier-based aircraft do not/not pay an additional cost to fly in their sea zone of origin.
- Carrier airstrike surprise: (1) defending land-based fighters cannot scramble against attacking carrier-based aircraft, (2) defending land-based AAA cannot fire against attacking carrier aircraft, and (3) attacking

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carrier fighters get one round of combat against land targets without incurring enemy counteraction.

- RAF/USAAF strategic bombers: no capability against ships.
- German/Japanese strategic bombers: German bombers: two vs. ships; Japanese: four vs. ships (torpedoes).

Additional Modifications:

- Strategic bombers vs. land/naval forces: can undertake a single unopposed attack (like NGFS and undetected sub attacks). In any continued rounds, ground forces/ships can shoot back.
- German/Japanese strategic bombers: roll on two vice four column when conducting strategic bombing.
- Chinese reactive mobilization: during the turn after any Japanese attack, Chinese infantry cost one IPC each. Must be brought on one per province. Any additional units must be distributed no more than one per province (maximum total: two new per province per turn).
- Lend-lease (L/L): Anglo-Americans can provide financial support to each other and/or the Russians. Maximum amount: approximately 15 percent of current cash holdings.
- Transaction costs: U.S. L/L to UK: three of every four IPCs provided arrive in UK. UK/U.S. L/L to USSR: two of every three IPCs arrive. (Costs apply only when convoy rule not used.)

AXIS AND ALLIES GLOBAL ROLES, MISSIONS, STRATEGY, AND FORCE STRUCTURE

Roles and missions of military force types		
	Continental	Maritime
Offensive		
Defensive		

Based on your assessment in your strategic planning checklist, number each cell above from one to four (ordinal) to rank the importance of each role/mission in your country's threat environment and optimal strategy.

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Weapons systems role/mission capabilities		Continental		Maritime		Aerial	
		Offense	Defense	Offense	Defense	Offense	Defense
Ground	Infantry						
	Mechanized Infantry						
	Artillery						
	Armor						
Naval	Aircraft Carriers						
	Battleships						
	Cruisers						
	Destroyers						
	Submarines						
	Transports						
Air*	Strategic bombers						
	Light bomb- ers						
	Fighters						

The AA40 unit costs and capabilities table quantifies the mission capabilities of the various weapons system types. Here the reader will infer from that data the higher order role capability the weapon type affords. Procedure: based on the unit-type offensive and defensive strengths and mobility specified in the AA40 unit costs and capabilities table, number each cell above from 1 to 3 (cardinal) to rate the capabilities of each weapons system type for the performance of the six distinct roles/missions.

Capability levels: 3 = high; 2 = medium; 1 = low.

Note that multiple weapons types can warrant similar ratings.

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INTELLIGENCE ESTIMATE:
GERMAN CAPABILITIES AND INTENTIONS



PROBABLE OBJECTIVES:

Retain: _____ Take: _____

ESTIMATE OF GERMAN INTENTIONS:

German course of action 1 (most dangerous): _____

German course of action 2 (most likely): _____

I&W INDICATORS:

COA 1: _____

COA 2: _____

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NATIONAL STRATEGIC PLAN

OBJECTIVES:

Retain: _____ Take: _____

STRATEGIC PLAN OF OPERATIONS:

Grand strategy: _____

Offensive or defensive? _____
Phasing of offensive versus defensive ops: _____

Continental strategy: offensive or defensive? _____
Phasing of offensive versus defensive ops: _____

Maritime strategy: offensive or defensive? _____
Phasing of offensive versus defensive ops: _____

DIPLOMACY:

Seek support (from whom, in the form of what, to accomplish what?): _____

Lend support (to whom, in the form of what, to accomplish what?): _____

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MILITARY OPERATIONS/PLAN OF CAMPAIGN:

Phase I: (attack/defend, where, against whom, to accomplish what?): _____

Phase II: (attack/defend, where, against whom, to accomplish what?): _____

Phase III: (attack/defend, where, against whom, to accomplish what?): _____

Phase IV: (attack/defend, where, against whom, to accomplish what?): _____

**STRATEGIC MILITARY FORCE
STRUCTURE REQUIREMENTS:**

Continental/Army: priority: _____

Roles (offensive/defensive): _____

Missions: _____

Maritime/Navy: priority: _____

Roles (offensive/defensive): _____

Missions: _____

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Air/Air Force: priority: _____

Roles (offensive/defensive): _____

Missions: _____

AFTER ACTION REVIEW:

Report on the Conduct of the War

- Your prewar estimate of enemy capabilities and intentions:
 - Europe-Africa/Atlantic
 - Asia/Pacific
- Your strategic war plan
- Your force structure design and build plan
- Your conduct of operations:
 - Successes
 - Failures
- Unexpected turns of events:
 - What/when/where
 - How/why
- Additional thoughts

Chapter Four

Building Wargame Designers and On-the-Job Training

Major Paul M. Kearney

INTRODUCTION

Wargaming comes from a well-established pedigree. Whether tied to the genesis of modern wargaming and *Kriegsspiel* or tied to ancient wargames like Chinese *Wei-Hai*, wargames have always had the military profession at their forefront.¹ Unfortunately, wargaming within the military profession suffers from a severe talent problem. Wargaming education within the Services is rare, compartmentalized, and insufficient. To overcome these challenges, organizations who wish to use wargaming methods effectively have sought to train wargamers in an on-the-job fashion, relying on a guild-like apprentice-master structure.² While wargames have become accepted as invaluable tools for military analysis and planning, wargame design still holds the stigma of grade-school geekery, and only those professionals with a hobby gaming background tend to break into the ranks of professional wargamers. Without significant investments, including new training and education courses, repeated engagements, and senior leader buy-in, the on-the-job nature of wargame design training is not likely to change.

Training new wargamers and wargame designers is not a trivial task. This chapter looks to establish and underscore

¹ Peter P. Perla, "Now Hear This—Improving Wargaming Is Worthwhile—and Smart," U.S. Naval Institute *Proceedings* 142, no. 1 (January 2016).

² Sawyer Judge, "The Wargaming Guild: An Art or Science?" (presentation, Connections 2021, Fort Leavenworth, KS, 21–25 June 2021).

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best practices in developing novice wargamers and building a cadre of skilled wargame designers by using a literature review of adult education research, best practices from wargame designer training programs, and the author's first-hand experience with on-the-job wargame designer training. An optimized pipeline for wargaming education is important to meet the growing demand for wargames and ensure that uniformed noncommissioned and commissioned officers, whose tenure in wargaming positions is often short, receive the appropriate development and ensure useful game design.

WHERE HAVE ALL THE WARGAMERS GONE?

Interest in wargaming within the Department of Defense (DOD) has never been higher. With the 2015 establishment of the \$10-million-a-year Wargaming Incentive Fund, headquarters of every type have looked to conduct wargames.³ Unfortunately, the resident expertise in wargaming is extremely limited in most units.⁴ Except for a small cadre of wargame designers that are clustered in war colleges, federally funded research and development centers (FFRDCs), or analytical centers, and within those organizations, experienced wargame designers are few and far between.

A lack of experienced wargame designers leads to two obvious problems. First, these individuals only have so much throughput. The wargaming handbook developed at the Center for Army Analysis estimates that a typical strategic wargame takes on the order of 13 weeks to design and execute.⁵ Overloading experienced designers with additional products

³ For more on the genesis of this initiative, see Robert O. Work Memorandum, "Wargaming and Innovation," 9 February 2015.

⁴ Yuna Huh Wong and Garrett Heath, "Is the Department of Defense Making Enough Progress in Wargaming?," *War on the Rocks*, 17 February 2021.

⁵ Paul M Kearney, "Analytical Wargaming at the Center for Army Analysis" (presentation, Connections 2021, Fort Leavenworth, KS, 21–25 June 2021).

leads to suboptimal wargames and potentially false learning.⁶ Second, with experienced wargamers unavailable, wargames may turn into a BOPSAT (a bunch of people sitting around talking).⁷ Or worse, they will have enough of the tactile features of a wargame to fool participants, but they will be bad designs. Succinctly put, “wargames are only as valuable as the designers who create them.”⁸ In short order, bad games will dampen interest in wargaming as a field.⁹

There is currently no pipeline to train wargamers. Instead, wargaming talent within the Department of Defense relies on self-motivated hobbyists who find their way into wargaming positions as civilians (general schedule or contracted wargamers) or by vagaries of the military human resource processes. Once in their positions, these hobbyists “turn pro” through on-the-job training, merging their personal interests with a deeper understanding of military activities and benefiting from the mentorship of more senior wargamers.¹⁰ Unfortunately, this makes the talent pipeline “informal, difficult to access, and produces games of uneven quality,” according to Dr. Elizabeth Bartels, a wargamer at Rand.¹¹ As a result, the most respected wargamers in the field today are products of this informal, on-the-job system.¹²

These experienced wargamers are nearly all civilians. While many have served in uniform at one time, there are few, if any,

⁶ *False learning* refers to the phenomenon wherein incorrect assumptions, biased adjudication rules, or other wargame factors lead to insights that are incorrect. See William F. Owen, “What’s Wrong with Professional Wargaming?,” *PAXSims*, 26 April 2020.

⁷ Perla, “Now Hear This.”

⁸ Sebastian Bae, “Just Let Them Compete: Raising the Next Generation of Wargamer,” *War on the Rocks*, 9 October 2018.

⁹ Stacie L. Pettyjohn and David A. Shlapak, “Gaming the System: Obstacles to Reinvigorating Defense Wargaming,” *War on the Rocks*, 18 February 2018.

¹⁰ Mark Wallace, “Wargaming Needs New Recruits to Save Lives,” *How We Get to Next*, 25 November 2016.

¹¹ Elizabeth Bartels, “Building a Pipeline of Wargaming Talent; A Two-Track Solution,” *War on the Rocks*, 14 November 2018, 1.

¹² John Curry, ed., *Peter Perla’s the Art of Wargaming: A Guide for Professionals and Hobbyists* (Annapolis, MD: Naval Institute Press, 2011), 275.

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truly experienced wargame designers currently serving in the military. According to a Military Operations Research Society (MORS), Wargaming Community of Practice survey, most designers did not consider themselves master-level wargamers until they had at least 10 years of professional experience leading wargaming efforts.¹³ Since Service wargaming efforts generally take place at staff schools, war colleges, and dedicated centers, wargaming experience for an officer does not begin professionally until around their 10th year of service.¹⁴ In the unlikely event that an officer is placed in a wargaming billet from first exposure to wargaming at a staff school like the U.S. Army's Command and General Staff College to an officer's eligibility for retirement, this officer would only develop mastery around the time they would exit military service.

The broad consensus of the wargaming community is that this organic pipeline is not sufficient to support the educational and analytical needs of the Joint Force.¹⁵ This chapter will look at the two dominant types of formalized wargaming education, historical and practicum approaches, and the broad literature on adult education to see how the organic pipeline can be improved to shorten the time requirement between novice and skilled wargame designers. Lastly, this chapter will close with recommendations for best practices for any staff headquarters with a wargaming mandate.

¹³ Elizabeth Bartels, "Insights from a Survey of the Wargaming Community" (brief, MORS Community of Practice, Santa Monica, CA, 7 September 2017).

¹⁴ Sebastian J. Bae and Paul M. Kearney, "Use Wargaming to Sharpen the Tactical Edge," *Rand* (blog), 8 March 2021.

¹⁵ Sebastian Bae, "Just Let Them Compete"; Bartels, "Building a Pipeline of Wargaming Talent"; Elizabeth M. Bartels, *Building Better Games for National Security Policy Analysis: Towards a Social Scientific Approach* (Santa Monica, CA: Rand, 2020), <https://doi.org/10.7249/RGSD437>; Owen, "What's Wrong with Professional Wargaming?"; Perla, "Now Hear This"; Wong and Heath, "Is the Department of Defense Making Enough Progress in Wargaming?"; Wallace, "Wargaming Needs New Recruits to Save Lives"; Bartels, "Insights from a Survey of the Wargaming Community"; and Curry, *Peter Perla's the Art of Wargaming*, 275.

ADULT EDUCATION AND WARGAMING

Wargaming education is adult education. Teaching complex skills like wargame design to adult learners requires an understanding of its unique conditions. This section will look at models of adult learning and discuss barriers to adult learning that are important to consider for wargaming education.

Adult learning is a broad academic field. The principles in this field are varied and often contradictory.¹⁶ On the whole, the literature suggests that adult learners have a few common traits. Adults learn best when the information or skill they are trying to learn is salient, has an immediacy to their professional lives, and is experiential.¹⁷ One important theory of “functional adult learning” first proposed by Graham Gibbs recommends that adult learning ought to be experience-centered and that experience must be meaningful to the learner.¹⁸ Additionally, adults are often more self-directed than their youthful counterparts. This means that adult learners are often more successful at learning skills that they have chosen to learn and are motivated to see through.

The most widely accepted model for experiential learning is the David A. Kolb learning model (figure 6).¹⁹ While sometimes criticized for being a simplistic, four-step model to describe complex learning, its simplicity makes it an adaptable template for describing experiential learning. It is especially useful for adult learning because the model depicts an iterative cycle rather than the Paulo Freire “banking model of learning.”²⁰

¹⁶ For an outline of several adult learning principles, see Stephen D. Brookfield, *Understanding and Facilitating Adult Learning: A Comprehensive Analysis of Principles and Effective Practices* (Buckingham, UK: Open University Press, 1986), 31–33.

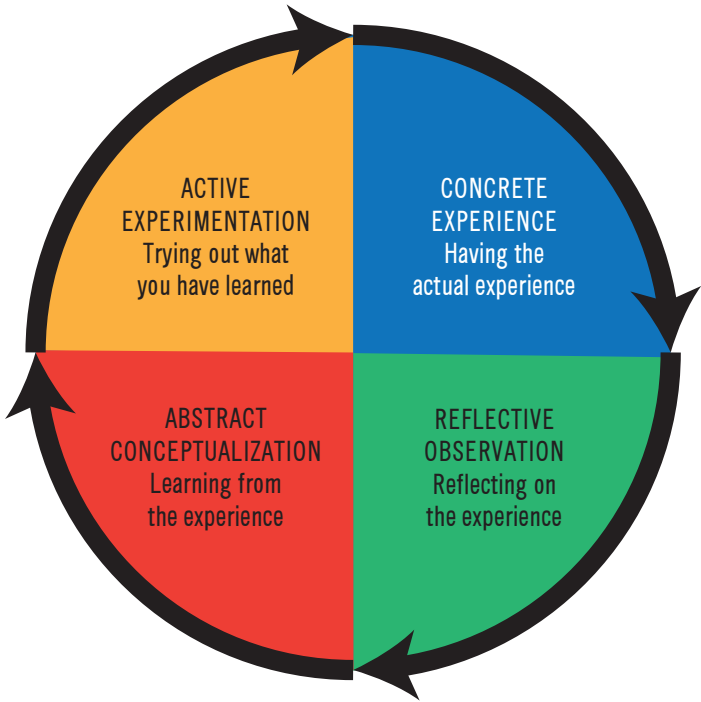
¹⁷ Brookfield, *Understanding and Facilitating Adult Learning*, 25–32.

¹⁸ Graham Gibbs, *Learning by Doing: A Guide to Teaching and Learning Methods* (London: Further Education Unit, 1988).

¹⁹ David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development*, 2d ed. (Upper Saddle River, NJ: Pearson, 2015).

²⁰ Gabrielle Micheletti, “Re-Envisioning Paulo Freire’s ‘Banking Concept of Education,’” *Inquiries Journal/Student Pulse* 2, no. 2 (2010).

Figure 6. Kolb learning model



Source: David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development*, 2d ed. (Upper Saddle River, NJ: Pearson, 2015), adapted by MCUP.

The banking model of learning imagines that a learned teacher unidirectionally transmits information to a student. Adult learning is less about received wisdom than it is about acquired understanding. This is particularly true of learning complex or art-based skills.

The Kolb learning model stresses active participation in learning by the student. In addition to experiencing something new, students must critically examine their new capabilities, conceptualize the important insights, and actively experiment

with those insights. This experimentation may result in a new experience, restarting the cycle. This learning model will be familiar to most wargamers because it is this same sort of learning that educational wargames try to elicit.²¹

There are significant obstacles to adult learning, however. They include indecisiveness or hesitation and barriers to break through or professional impact. Indecisiveness or hesitation serves as a mental block to adult learning. Adult learners are often more successful at skill acquisition and complex skill learning than children because they have greater autonomy over what they want to learn.²² While it may take an incredibly engaging teacher to get an engineering major excited about the required English literature course, adult learners are typically self-motivated or incentivized. Adult learners are either studying topics they are interested in personally or, in a work setting, only learning what is necessary for their chosen profession, and are therefore incentivized by career concerns.²³ But indecisiveness still affects learners in this setting. Novice wargamers might not think themselves capable of wargame design because of the noticeably unrepresentative make-up of the wargaming community.²⁴ Adult learners in other settings may see themselves as not fitting into the mold of what that profession seems to be. Therefore, there is hesitancy even to start the investment in learning.

Adult learning also has a high barrier to breakthrough. Since adult learning for complex skills is primarily experiential, learning at the beginning is difficult and overwhelming. The hallmark of a positive start to experiential learning is the right

²¹ Peter P. Perla and E. D. McGrady, "Why Wargaming Works," *Naval War College Review* 64, no. 3 (Summer 2011).

²² Horng-ji Lai, "The Influence of Adult Learners' Self-Directed Learning Readiness and Network Literacy on Online Learning Effectiveness: A Study of Civil Servants in Taiwan," *Journal of Educational Technology & Society* 14, no. 2 (2011): 98-106.

²³ Lai, "The Influence of Adult Learners' Self-Directed Learning Readiness and Network Literacy on Online Learning Effectiveness," 98.

²⁴ Sally Davis, "Wargaming Has a Diversity Problem," *Wavell Room*, 15 January 2021.

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initial experience and appropriate support through the first cycles of reflection, conceptualization, and experimentation. Often getting the first opportunity to try a complex skill can be hard. If an adult learner is able to get the first experience, they will likely still need a guiding hand through the reflection, conceptualization, and experimentation portions of the first cycle(s). They also might not feel that failure in experimentation is an option in situations where professional reputation or even livelihood is on the line. Without a foundation of experiential learning in the complex skill that an adult learner hopes to master, they will not be equipped with the tools to develop beyond the most basic level.

WARGAMING EDUCATION

The field of wargaming has very few formal training programs to train and educate wargame designers. There are two similar but distinct approaches for getting new wargame designers into the design process for wargaming.

The first approach is a historical wargaming approach. This method is employed by several organizations like the U.S. Naval Academy in Annapolis, Maryland; the Marine Corps Command and Staff College in Quantico, Virginia; and at Georgetown University in Washington, DC, among others.²⁵ These relatively new programs use well-documented battles or operations, allowing new wargamers to research the commanders' critical decisions and available capabilities. Under the steady hand of an experienced wargamer, these apprentices build wargames designed to have their players experience the battle from the perspective of one of the historical figures. Apprentice wargamers get the benefit of being able to examine the actual course of a battle, posit counterfactual histories, and experiment with varied game mechanics with a known historical outcome to judge against. At the end of this semester-long course, students will have completed a full, working wargame based on a historical

²⁵ Sebastian Joon Bae, interview with the author, 19 June 2021.

operation and been exposed to many of the design considerations a wargamer must deliberate when building a game.²⁶

The second approach is the practicum model. This model is employed at the Naval Postgraduate School in Monterey, California, and the U.S. Air Force Academy in Colorado Springs, among others.²⁷ In this approach, new wargamers are matched with sponsors who have specific analytical questions that could benefit from wargaming. The instructor, in this case experienced wargame designers such as Dr. Jeff Appleget or Dr. James D. Fielder, works with the student-officers to design wargames for real-world customers.²⁸ Similar to the historical wargaming approach, students end the course with exposure to many design considerations and will have completed the design of a full analytical wargame.

Both approaches combine classroom instruction and practical experience. The curriculum for each course introduces apprentice-students to theory and practical considerations for designing wargames, and both methods typically involve exposure to existing wargames to develop familiarity with game mechanics, different turn sequences, and the tradeoffs between realism and simplicity.

Formal educational programs that teach the underlying requirements for wargaming, or any such design-based skill, will invariably fall short in practical usefulness as the field hosts more specialties and variations than any single course could cover.²⁹ This shortcoming is why on-the-job training exists to some extent in every field.

²⁶ Caitlyn Leong, Charles Lewis, and Nikolai Rice, "Designing a Wargame: Reconquering Rome" (presentation, Georgetown University Wargaming Society, Washington, DC, 2 June 2020).

²⁷ Jeff Appleget et al., *Wargaming at the Naval Postgraduate School*, CRUSER Report (Monterey, CA: Naval Postgraduate School, 2016); and *Course of Instruction, 2021–2022* (Colorado Springs, CO: U.S. Air Force Academy, 2021), 356.

²⁸ Appleget et al., *Wargaming at the Naval Postgraduate School*, 19–20.

²⁹ Jacob Mincer, "On-the-Job Training: Costs, Returns, and Some Implications," *Journal of Political Economy* 70, no. 5, pt. 2 (October 1962): 50, <https://doi.org/10.1086/258725>.

OPTIMIZING THE ORGANIC PIPELINE

Despite the emergence of formal wargaming programs at certain professional military education and civilian schools, the path from a novice wargamer to a skilled one relies on the organic guild-like pipeline.³⁰ What follows are some best practices in wargaming education that are supported by the academic literature on adult education, interviews from experienced wargamers, and the experiences of the author.

Concrete Experiences in Design and Iteration

As with many skills, learning by doing remains the gold standard for complex skill acquisition. The sooner that a wargamer can begin to design games, the sooner they are on the path toward mastery. Much as with other guild-like training, one senior wargamer says, “There is no replacement for actually standing at the anvil.”³¹ This is why formalized training courses generally include designing a wargame. This is intuitively obvious for other complex skills-based tasks. Using the previous example, no one would hire a blacksmith who has read all the latest books on metallurgy but has never hammered steel. This comports well with the Kolb model of experiential learning.³² Since complex skills are not directly transferable from teacher-to-student via lecture halls, it makes sense that wargame design training would be experiential in nature.

Getting even a single repetition completed is a large hurdle for adult learners and novice wargamers. It shatters the belief that wargamers are “born, not trained” and overcome mental blocks.³³ After the design process of a single wargame, novice wargamers will have built confidence and will have the tools required to continue self-development. Self-development, es-

³⁰ Judge, “The Wargaming Guild.”

³¹ Sebastian Joon Bae, “In seriousness, I found being a copilot with someone senior teaching me as I go was how I learned. Reading or watching materials is good, but there is no replacement for actually standing at the anvil and designing games,” Twitter, 21 July 2021, 1346.

³² Kolb, *Experiential Learning*.

³³ Bartels, “Building a Pipeline of Wargaming Talent.”

pecially with adult learners, is a key factor in determining future success.³⁴ That single event equips a novice wargamer with the ability to build on that foundation to continue their own training.

A best practice for developing novice wargamers is finding ways to allow them to design new games quickly. One tool for this activity is Andrew Peterson and Matthew Smith's *Rapid Prototyping Game*.³⁵ It is a card-based game that allows wargame designers to think through the game design process without needing a broad repertoire of game mechanics and designs. This is because the game provides an encyclopedic deck of common mechanics and design considerations. Pairing novices with experienced wargamers and allowing the novices to build and pitch game designs in a structured way, using the *Rapid Prototyping Game* or a tailored deck of mechanics and designs most useful to their field, provides novices with a way to get more experience designing wargames in a free-to-fail way—or wargame wargaming design!

Hobby Game Utilization

To expose novice wargamers to the myriad of possible game mechanics, one best practice is to use hobby games as teaching vehicles. It is no accident that the most celebrated wargamers were first hobby gamers.³⁶ Commercial off-the-shelf games have several advantages that are important for novice wargamers. Successful commercial games tend to be engaging. Their commercial success generally hinges on how they draw a player in and how much fun they are to play.

Hobby games also do not typically take days to complete. A recent wargame conducted by the Center for Army Analysis was conducted during three days of gameplay with an

³⁴ Kolb, *Experiential Learning*.

³⁵ Andrew Peterson and Matthew Smith, *The Rapid Prototyping Game*, 1st ed. (Boca Raton, FL: CRC Press, an imprint of Taylor & Francis, 2020).

³⁶ Curry, *Peter Perla's the Art of Wargaming*, 275.

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additional half-day to train players.³⁷ Many hobby games can be set up, the basics understood, and played in a few hours. More importantly, completing the game is not necessary for the game to become an educational tool. One best practice along these lines is an intensive on-the-job training course that utilizes a “wargame lab.”³⁸ In the Strategic Wargaming Division at the Center for Army Analysis, novice wargamers are exposed to different hobby games for three hours each week during the first eight weeks of their employment. Some games, such as *Risk*, are used to examine the basic elements of a wargame and their adaptability.³⁹ Different versions of *Risk*, including *Risk: Star Wars* and *Risk: Game of Thrones*, teach novice wargamers how a solid system can be adapted to different objectives.⁴⁰ Other hobby games, such as *Terraforming Mars*, are used to explore cooperative-competitive relationships and how those relationships can be understood through wargaming.⁴¹ In addition, all wargamers meet for wargaming labs monthly. The key to these wargame labs is not simply playing new games—though increased exposure is valuable in its own right—but also to critique and explore the design tradeoffs with a larger group of wargamers at every level of experience. This ties the wargaming lab back to the Kolb cycle of learning.⁴²

Hobby games also have thematic hooks. Part of the challenge of training new wargamers is overcoming the mental barriers of adult learners. Using a hobby game based on a theme

³⁷ Devon Suits, “Army Implementing ReARMM Unit Life Cycle Model,” *Army News*, 2 March 2021.

³⁸ This approach is used for the internal new strategic wargamer’s on-the-job training developed at the Center for Army Analysis by Dr. Josh Jones and Ms. Claire Fisher, supported by Dr. Karsten Engelmann. Their efforts provided a way to bridge the author’s previous research on wargaming and experiential learning with practical examples for teaching wargame design. The author is deeply indebted to them for their support and mentorship.

³⁹ *Risk: The Game of Strategic Conquest* (Pawtucket, RI: Parker Brothers, 1959).

⁴⁰ *Risk: Star Wars Edition* (Pawtucket, RI: Parker Brothers/Hasbro, 2005); and *Risk: A Game of Thrones Edition* (Carlsbad, CA: USAopoly, 2015).

⁴¹ *Terraforming Mars* (Vellinge, Sweden: FryxGames, 2016).

⁴² Kolb, *Experiential Learning*.

that excites and engages the target audience helps overcome anxiety about learning a new adult skill. Adjunct Professor Sebastian Bae uses *Risk: Game of Thrones* to hook his students in at Georgetown University. Once students are immersed in a learning environment, the experience is more salient and impactful. On-the-job training can benefit from thematic hooks. The variety and breadth of available commercial wargames ensure that there is likely a wargame to match the interests of new wargamers.

Hobby games represent fertile ground for design starting points. Seeing how commercial designers replicate battlefield effects can be incredibly useful for novice wargame designers. In a formal program at the U.S. Air Force Academy, Professor James Fielder reports that deconstructing the game mechanics and “innards” of hobby games allows novice designers to learn design fundamentals more completely than lectures or reading alone can accomplish.⁴³ Novice designers in his program used elements from several different hobby games to achieve their sponsors’ objectives for the wargame. This gave the designers a tested starting point, rather than requiring them to begin the difficult design process from an unknown point.

Leverage the Wargaming Network

As a guild-type organic pipeline, there is no escaping the need for skilled master wargamers to guide and support novice wargamers through their development; however, this does not need to be limited to the novice’s organization. The community of hobby wargamers is actively engaged. While the community has challenges with diversity, efforts are underway to remove this barrier to entry.⁴⁴

Wargaming communities and conferences such as MORS’ Wargaming Community of Practice and Connections have re-

⁴³ James “Pigeon” Fielder, “Reflections on Teaching Wargame Design,” *War on the Rocks*, 1 January 2020, 1.

⁴⁴ “The Derby House Principles,” *PAXSims*, February 2021.

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sources available for new wargamers and provide a vehicle for connecting with experienced wargamers, most of whom are excited to share their love of wargaming with novices.⁴⁵ With the increased popularity of virtual conferences, the cost of traveling to conferences has been greatly reduced. Moreover, a growing number of university-based wargaming groups such as the King's College London Wargaming Network and the Georgetown University Wargaming Society bring wargaming content to novice wargamers online for free.⁴⁶

A STRONGER PIPELINE

Increasing demand for wargames and a limited pool of experienced designers means that developing new wargamers is more important than ever. But the process of adult education to take a novice wargamer and equip them with the tools for rapid self-development and complex skill mastery is difficult.

The challenges of adult education and experiential learning for complex skills stifle efforts to develop new wargame designers. Hesitance to start and barriers to breakthrough limit the numbers of willing candidates. Lacking formal pipelines for wargame design means that organizations that conduct wargaming must develop their own wargame designers.

Organizations that hope to shorten the time from novice to skilled wargame designers should follow best practices supported by adult learning models and practical experience. They include teaching by doing to build concrete experience and overcome barriers to breakthrough, incorporating hobby games both to drive interest and explore game mechanics/

⁴⁵ In recent years, the Connections series of wargaming conferences have been hosted virtually, including Connections-U.S., Connections-North, Connections-UK, and Connections-Oz due to COVID-19 travel restrictions. A new annual event for the Connections series, Connections-Online, has been added to the roster to remain as a virtual conference.

⁴⁶ "Georgetown University Wargaming Society (GUWS)," GUWargaming.org, accessed 31 March 2022; and "Wargaming Network," King's College London, accessed 31 March 2022.

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design. To do this, they should leverage the wider field of wargaming groups to reduce barriers to entry and foster a more inclusive environment in wargaming.

Novice wargamers, when supported in this way, have the opportunity to realize their potential and grow the population of skilled wargame designers needed to support educational wargaming efforts.

Chapter Five

WARGAMING IN PME

Introducing Wargaming to the Australian Defence College

*Lieutenant Colonel Scott Jenkinson
and Group Captain Jo Brick*

The qualities needed to play all strategic war games well include forethought, the ability to make a plan and execute it, avoidance of the temptation to over-reach oneself when experiencing an advantage, and the courage to face unexpected adverse developments calmly and with resolution. These are some of the same qualities which are required of real-life leaders, not just in military jobs but as statesmen and as the managers of large companies.

~ Christopher G. Lewin¹

Social historian Christopher Lewin highlights the value of using wargames in education. The development of strategic foresight, critical thinking, judgment under pressure, and collaborative approaches to problem solving are some of the key learning outcomes when games are used for education. The origins of wargaming for education in standing military forces are generally attributed to the Prussians and the game *Kriegsspiel*, which was developed by a civilian, Baron Georg Leopold von Reisswitz, for Crown Prince Frederick William in 1811.² Since then, many modern military forces use wargames for educa-

¹ C. G. Lewin, *War Games and Their History* (Stroud, UK: Fonthill Media, 2012), 9.

² Lewin, *War Games and Their History*, 41–42.

tion, analysis, and experimentation. In Australia, the current focus is on using wargames for analysis and experimentation. However, the use of wargames in education does not have a strong foundation and is currently employed inconsistently across the Australian Defence Force (ADF). As a result, the ADF has limited experience in the use of games for education and a minimal appreciation for how wargames can enhance learning. The Australian Defence College (ADC) is focused on five key lines of effort to reinvigorate the use of wargaming for education:

1. Find opportunities to incorporate games into formal courses and encourage efforts by current directing staff at the Australian War College to use games to enhance the delivery of formal curricula.
2. Establish a deputy director of wargaming position, whose primary duty is to review ADC courses, to work with commandants and instructional staff, to identify and enhance opportunities for learning through formal/informal incorporation of games into ADC courses and to engage with partner educational institutions across allied and partner nations.
3. Establish an ADC Wargaming Society—a network within the college to normalize gaming—as a means of introducing interested personnel in games and wargaming and is backed by a funded and resourced base at the ADC.
4. Host a seminar on advocacy and education that gathers like-minded groups in the Australian Defence Organisation who have used games for education and training, but also for other purposes (such as analytical wargaming) and to promote the usefulness of games as models.
5. Establish a national and international network for wargaming in education.

This chapter will be confined to an examination of wargam-

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ming for the purposes of education. It will examine the brief history of wargaming in the ADF and discuss how these lines of effort will form the foundation for a more consistent and enduring framework for the incorporation of wargames into professional military education (PME) in Australia.

WARGAMING FOR EDUCATION

Why, while the clouds of war thickened above them, would a group of serious-minded, middle-aged men waste their time on a board game?

~ Simon Parkin³

A Short History

Games offer a means by which students can play with the content and concepts presented to them in lectures and seminars. Games enhance learning through the development of tactical insight and planning and test military plans through simulation. Further, other nonmilitary games may offer learning outcomes about leadership, high-level strategy, and interagency cooperation through abstract game concepts and mechanics. The answer to the rhetorical question posed by Parkin, is that time spent in gaming is there to enhance and complement other education methods by discovery learning, where students take an active role to create, integrate, and generalize knowledge and establish broader applications for skills through activities that encourage risk-taking and problem solving.⁴

The Prussians are generally recognized as the first to use wargames to educate their military forces. As previously stated, Baron Leopold von Reisswitz created *Kriegsspiel* to educate the crown prince. However, the real success of the

³ Simon Parkin, *A Game of Birds and Wolves: The Secret Game that Won the War* (London: Hodder & Stoughton, 2019), 41.

⁴ Joyce A. Castronova, "Discovery Learning for the 21st Century: What Is It and How Does It Compare to Traditional Learning in Effectiveness in the 21st Century?" (unpublished paper, 2002), 1-12.

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Prussians came after Helmuth von Moltke, as chief of staff of the Prussian Army, mandated the broader use of wargames, particularly at the war colleges.⁵ Wargaming was part of the curriculum, which already included strategy, military history, and planning. However, wargames also complemented another innovation von Moltke introduced—the staff ride. This involved von Moltke taking the war college class to a Prussian invasion corridor and asking students to present a plan for battle between the Prussians and attacking forces. Officers were expected to present in turn, starting with the most junior, and the subsequent discussion between the students would result in the development of the plan. This plan would be played on a simple map-based game and be tested.⁶ According to Matthew B. Caffrey Jr., the institutionalization of wargaming in the Prussian military enhanced the ability of officers to plan and to mitigate the haphazard competence of their officers, who were often selected on the basis of their aristocratic lineage rather than merit.⁷

Prussian innovation in military education and training was borne out of the drive to defeat Napoleon Bonaparte. But why should the ADF wait for an equivalent formidable adversary to manifest itself? As U.S. Army lieutenant general David Barno and Nora Bensahel argue, predicting the future nature and character of warfare is unlikely to be accurate and this can only be effectively addressed by creating an adaptive culture in modern military forces.⁸ A strong planning capability and adaptive culture are keys to success and can be developed through the use

⁵ Matthew B. Caffrey Jr., *On Wargaming: How Wargames Have Shaped History and How They May Shape the Future*, Newport Papers no. 43 (Newport, RI: Naval War College, 2019), 17–18.

⁶ Caffrey, *On Wargaming*, 18–19.

⁷ Edward Melton, “The Prussian Junkers, 1600–1806,” in *The European Nobilities in the 17th and 18th Centuries*, vol. 1, *Western Europe*, ed. H. M. Scott (New York: Palgrave Macmillan, 2007), 118–71.

⁸ See David Barno and Nora Bensahel, *Adaptation under Fire: How Militaries Change in Wartime* (New York: Oxford University Press, 2020), <https://doi.org/10.1093/oso/9780190672058.001.0001>.

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of games in education by instilling critical thinking, flexible and adaptive planning in the midst of the contest, and managing the available resources to achieve objectives as the plan makes contact with an adversary.

In the U.S. Army, it is unclear when wargaming became an institutionalized practice. Caffrey estimates that it probably started at the Command and General Staff College, where it was introduced as part of the curriculum.⁹ Part of the “application method” used at that school involved teaching subjects in conventional lectures, then small group discussion, and finally an individual plan development that culminated in a group wargame (“map maneuver” or writing orders and executing them against an actual adversary).¹⁰ William McCarty Little wrote and delivered the earliest known lecture on wargaming in 1886, and subsequently wargames were introduced in the Naval War College in 1894.¹¹ In 1913, William S. Sims introduced wargaming to the broader Navy fleet.¹²

A Problem of Definition

There is no single, commonly accepted definition of wargaming. The North Atlantic Treaty Organization (NATO) defines *wargames* broadly as: “a simulation of military operation, by whatever means, using specific rules, data, methods and procedures.”¹³ Such a wide-ranging and broad definition is of limited use, however, and ignores the central role placed on the decisions of the players.

A purposive approach to defining the term offers greater utility by distinguishing it from other uses of wargames, such as for analysis and experimentation. Focusing on education as the purpose of wargaming ensures that the method is linked

⁹ Caffrey, *On Wargaming*, 24.

¹⁰ Caffrey, *On Wargaming*, 24.

¹¹ The lecture given by William Little Hall at the Naval War College was reproduced in the U.S. Naval Institute *Proceedings* 38 (December 1912): 1213–33.

¹² Caffrey, *On Wargaming*, 25.

¹³ Quoted in *Wargaming Handbook* (Shrivenham, UK: Ministry of Defence, 2017), 5.

to the learning objectives of a particular program of education or training.

Purposive Definition

For the purposes of this paper, the term *wargame* covers games that are representative

of military activities, using rules, data, and procedures, not involving actual military forces, and in which the flow of events is affected by, and in turn affects, decisions made during the course of those events by players acting for all actors, factions, factors and frictions relevant to those military activities.¹⁴

Themes and Concepts in Abstract

Further, the use of the term wargames may be driven more by the need to convey the message that the uses of games are not frivolous but are a serious endeavor for education. This approach allows for a broader perspective on the types of games that can be used for PME. Games, not just wargames (or games with a focused military theme), can enhance PME through the abstract themes and concepts that they present by focusing on conflict and competition through a nonmilitary lens. What becomes important are the characteristics of the games themselves. As noted by Robert T. Hays, “It is not the medium on which the game is played, but its characteristics that make it a game.”¹⁵ For this reason, the United Kingdom’s Ministry of Defence *Wargaming Handbook* list of the “core of wargames” is useful. The core of wargames is defined as:¹⁶

- The players;

¹⁴ “What Is Wargaming?,” LBS Consultancy, accessed 11 August 2021, an acknowledged adaptation from Peter Perla.

¹⁵ Robert T. Hays, *The Effectiveness of Instructional Games: A Literature Review and Discussion*, Technical Report 2005-004 (Orlando, FL: Naval Air Warfare Center Training Systems Division, 2005), 11.

¹⁶ *Wargaming Handbook*, 5.

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- The decisions they make;
- The narrative they create;
- Their shared experiences; and
- The lessons they take away.

Under this construct, a game does not need a military focused theme to have relevance to PME. The key is to ensure that the game selected is appropriate for the learning objectives and outcomes of the particular course. In the ADF context, it is possible to use either the term game or wargame. The theme of the game is not as important as its relevance to the learning outcomes of education and training courses at each level of the Australian Joint Professional Military Education Continuum, which is Australia's system to develop mastery in the profession of arms and aims to cultivate an intellectual edge (figure 7).¹⁷

More work is required to link appropriate games to the learning objectives in various ADF courses. For example, Joint Professional Military Education and Training (JPMET) levels 1 and 2 are focused on ab initio (beginner level) training and junior officers would generally be focused on tactical mastery. In an army context, this would mean focus on combined arms and tactics. Games such as *Advanced Squad Leader* or *Flames of War* may be of use as part of courses for this cohort of officers.¹⁸ By contrast, officers from O4 (major) and up (at JPMET levels 3 to 5) would require a greater focus on operational and campaign planning. The U.S. Marine Corps game *Assassin's*

¹⁷ See *The Australian Joint Professional Military Education Continuum* (Canberra, AU: Defence Publishing Service, Department of Defence, 2019), 17. Australian Joint PME levels are: Learning Level 1–Professional foundation (ab initio to first appointment course O2 (1stLt)/APS 2–4); Learning Level 2–Tactical Mastery (O2–junior O4/APS 4–6); Learning Level 3–Operational Art (mid O4–mid O5 (LtCol)/APS 6–EL1); Learning Level 4–Nascent Strategist (senior O5–O6 (Col)/EL1–EL2); and Learning Level 5–National Security Leadership (O7+ (BGen)/SES 1+). These ranks are compatible with those of other NATO members.

¹⁸ *Advanced Squad Leader* (Baltimore, MD: Avalon Hill Game Company, 1985); and *Flames of War* (New Zealand: Battlefront Miniatures, 2002).

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Figure 7. Australian Joint Professional Military Education Continuum (modified for context)

	Induction	Intermediate	Joint	Integrated	National	
DEFENSE	Cognitive abilities	Critical and creative thinking	Linear planning	Complex systems thinking	Design thinking	Multiagency worked problems
	National security policy and strategy	National and military power awareness	Operational planning Military science	Campaign planning Operational art	Theater operations Strategic art	Coalition political acumen
	Profession of arms	Own domain awareness	Own domain mastery Joint awareness	The art of war Joint competency	Military power Joint mastery	Integrated national power
TECHNICAL	Employment category	Own domain processes	INITIAL Employment competence ADVANCED Specialization expertise	Joint effects	Capability Leadership	
	Joint streams	Basic military skills	GENERAL ADF Knowledge and skills	Defense Capability Structures	Integrated systems	Civil-military interface
SOCIAL	Influence	LEAD SELF	LEAD TEAMS	LEAD OPERATING SYSTEMS	LEAD CAPABILITY	LEAD INTEGRATED SYSTEMS
	Military ethics and values	Conceptual frameworks Defense values Identity awareness	Ethical philosophies Trust development through consistency	Moral leadership Mature signature presence	Stewarding the profession Charismatic identity	Lead organizational crises Character excellence
	Character	ADF culture alignment	Promotion of ADF culture	Sociologically aware	Cross-cultural leadership	Multinational leadership
	Culture	Diversity appreciation	Celebrate diversity	Cultural leadership		



Source: *The Australian Joint Professional Military Education Continuum* (Canberra, AU: Defence Publishing Service, Department of Defence, 2019), adapted by MCUP.

Mace or *Twilight Struggle* by GMT Games would be effective complements to education and training courses focused on operational and strategic plans.¹⁹

The drive to include wargames into the ADC curriculum is based on the goal of enhancing lifelong learning that is nec-

¹⁹ See Wargaming Division, “An Invigorated Approach to Wargaming,” *Marine Corps Gazette* (February 2020): 19–21; Ananda Gupta, “Wargame Design Decisions in *Twilight Struggle* and Elsewhere,” *Forge*, accessed 21 June 2021; and *Twilight Struggle* (Hanford, CA: GMT Games, 2005).

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essary for the military profession and to develop strategic acumen or strategic thinking traits in the senior cohorts of the defense organization. Wargaming is central to achieving these objectives, as outlined by Philip Sabin as follows:²⁰

- Games highlight questions that are generally overlooked when using only “selective and linear approach of conventional scholarship.” These questions consider underlying influences in conflict, such as the relative importance of leadership, logistics, terrain, and time, and alternative options for key decisions actually taken.
- Wargames convey a vicarious understanding of some of the strategic and tactical dynamics associated with real military operations. This experiential approach to learning provides students with an instinctive understanding for some of the decisions and interactive aspects (action/reaction) that are central to warfare.
- Wargames are a form of “active learning” when compared to traditional lecture and seminar pedagogical methods. Sabin highlights that lectures have the advantage of “rapid delivery of precisely tailored information and interpretations to large audiences” and require minimal preparatory work on the students’ part.²¹ However, lectures have their weaknesses and Sabin states that “reducing a module equating to nearly three months of full-time study into the learning and repetition of a few dozen hours of lecture material seems to me the very antithesis of education.”²²

PME institutions covet the development of strategic think-

²⁰ Philip Sabin, “Wargaming in Higher Education: Contributions and Challenges,” *Arts and Humanities in Higher Education* 14, no. 4 (October 2015): 333, <https://doi.org/10.1177/1474022215577216>.

²¹ Philip Sabin, *Simulating War: Studying Conflict through Simulation Games* (London: Bloomsbury Academic, 2014), 36.

²² Sabin, *Simulating War*, 37.

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ing as a means of growing the intellectual edge necessary for senior appointments across the defense portfolio. Major General Mick Ryan, commander of the Australian Defence College, wrote:

We should seek to provide our strategic thinkers with real-world experiences that challenge them; construct diverse, multidisciplinary teams that test and extend their skills; and expose them to a wide variety of educational opportunities.²³

The dynamic, interactive, competitive, and collaborative nature of wargames provides valuable opportunities to develop strategic thinking through the practical experiences they provide. When combined with the development of knowledge and expertise, wargames fulfill the need articulated by Major General Ryan for “a community of thinkers whose expertise and experience can be connected and meshed to ensure a more fulsome strategic discussion and debate on specific issues.”²⁴

Dr. Murray V. Simons also proposes the importance of “learning the profession” in PME institutions rather than “learning the game” (tricks to earn high grades with less effort) or “learning to be an expert” (topic specific knowledge). According to Simons, learning the profession is the ultimate goal of PME, such as staff college, as it involves students gaining a system-level appreciation and the larger strategic picture. This involves students “joining the dots” and “filling in gaps.”²⁵ Dr. Simons taught and implemented many of his ideas at the New Zealand Command and Staff College.

The New Zealand Command and Staff College introduced

²³ Mick Ryan, *Thinking about Strategic Thinking: Developing a More Effective Strategic Thinking Culture in Defence*, The Vanguard, no. 1 (Canberra, AU: Department of Defence, 2021), 2, <https://doi.org/51174/VAN.001/ILJO7539>.

²⁴ Ryan, *Thinking about Strategic Thinking*, 11.

²⁵ Murray V. Simons, “Nurturing Professional Military Wisdom: Holistic Professional Military Development” (presentation, International Military Testing Association, South Kuta, Bali, 30 October–3 November 2011).

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several different initiatives that did not focus on the production of academic products, such as essays or papers, but other pedagogical approaches such as reflective journals and sessions.²⁶ By comparison, significant parts of the PME programs at ADC have a traditional, output-based academic focus. Further work needs to be done to include alternatives, such as periods of reflection and practical participation sessions to enhance learning, with wargaming as an important option to draw together the different elements in a system level appreciation that is necessary to learn the profession rather than just focus on purely academic products.

HISTORY OF WARGAMING IN THE ADF

Unfortunately, the people who had a major impact on wargaming itself are unknown not only to the general public but also, largely, to today's military. This struck me as both unjust and dangerous. I also observed that the art, science, and application of wargaming are not always passed on to the next generation. History seems to show that, when used effectively, wargaming provides a powerful advantage, while wargaming amnesia contributes to higher casualties.

~ Matthew B. Caffrey Jr.²⁷

The ADF suffers from wargaming amnesia. There is no single record of the ADF's forays into wargaming throughout its history. It is only through the effort of a former U.S. military officer—retired Air Force Reserve colonel Matthew Caffrey—that we have written snapshots of the ADF's history of wargaming. In *On Wargaming*, Caffrey provides brief outline of the history of wargaming in the ADF, primarily in the Australian Army.

In the early history of the Australian military forces, officer's

²⁶ Simons, "Nurturing Professional Military Wisdom: Holistic Professional Military Development."

²⁷ Caffrey, *On Wargaming*, vi.

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mess halls were the focal point for socializing and professional development. Sir John Monash was a keen user of games to develop himself and his subordinates. Then-Lieutenant John Monash recommended that wargaming be used as principal development opportunity in messes.²⁸ Later, as Major General Monash, he directed the use of a purpose-built trench system for field training events and wargames to train units up to brigade size.²⁹

The early years of Australian wargaming involved sending senior officers to allied and NATO war colleges, where wargames are used as part of PME. However, these games were not suited to Australia's strategic environment due to their scale and the first attempts to develop games of relevance to Australia occurred in the 1970s.³⁰ In 1972, then-Lieutenant Colonel J. C. Grey (who later became a lieutenant general and the chief of the general staff) visited the U.S. Army and saw the utility of wargaming. He wrote a paper that recommended the use of wargames in the Australian Army. This recommendation was endorsed, and in 1977, a Field Force Command War Gaming Conference was held, chaired by then-Colonel Henry John Coates (who was later promoted to lieutenant general and was chief of the general staff prior to Grey). The conference confirmed the value of wargaming to the Australian Army, resulting in the acquisition of wargames from the United States and the United Kingdom.³¹

The 1980s were perhaps the pinnacle of wargaming activity in Australia. The Australian Army released "Training Simulation Techniques: War Games," *Training Information Bulletin 52* (TIB 52), which defined wargaming and described its application. TIB 52 also provided guidance and a list (in the appendix)

²⁸ Caffrey, *On Wargaming*, 22.

²⁹ Caffrey, *On Wargaming*, 42; as cited in Peter A. Pedersen, *Monash as Military Commander* (Carlton, Victoria: Melbourne University Press, 1985), 166–67.

³⁰ Peter J. McCarry, *This Is Not a Game: Wargaming for the Royal Australian Air Force* (Canberra, AU: RAAF Air Studies Power Center, 1991), 10–11.

³¹ McCarry, *This Is Not a Game*, 11.

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of wargames to be used for individual and collective training.³² A significant milestone was the creation of the Australian Army War Game Centre (AWGC) in 1984. AWGC was part of Headquarters Training Command, and focused on two categories of games “pertinent to the Australian Army”: training wargames (decision and procedural games) and wargames for operations research (analysis of force structure and exercise/contingency planning). The AWGC was also focused on developing wargaming skills in the Australian Army.³³ An AWGC Working Paper (WP 84-21) was subsequently published that explained the requirements for future wargaming in Australian Army. The focus would be on “practicing decision making at all levels, practicing staff procedures from company through to corps headquarters; helping develop, refine, and test contingency plans; and examining force structure alternatives.”³⁴ The AWGC became the Army Battle Simulation Group (ABSG) in the 1990s, with a renewed focus to explore the use of simulation for Australian Army capability and analytical wargames for unmanned systems.³⁵

The creation of the ABSG perhaps represents the decline of wargaming in the Australian Defence Force, commensurate with the rise in simulation throughout the 1990s. The ADF Warfare Centre was established in the 1990s to conduct joint operations training for the ADF. The center is now the ADF Warfare Training Centre (ADFWTC) and part of the Australian Defence College. The ADFWTC includes a small Wargaming and Simulation Centre that is focused on “the exploit[ation of] new technologies to improve learning outcomes through the use of Virtual and Augmented Reality products and associated game software.”³⁶ Currently, there is minimal focus on the use of ta-

³² Caffrey, *On Wargaming*, 112.

³³ Army Office Staff Instruction No. 17/84, “War Gaming in the Australian Army,” 1984.

³⁴ Caffrey, *On Wargaming*, 114.

³⁵ Caffrey, *On Wargaming*, 165.

³⁶ “Australian Defence College: Wargaming and Simulation Centre,” Defence.gov.au, accessed 12 July 2021.

bletop games for PME in the ADF. Most of the extant wargaming capabilities in the ADF are focused on either analytical wargaming or simulation in joint collective training in a live-virtual-constructive (LVC) environment.³⁷ These LVC capabilities are often employed in major exercises such as Exercise Talisman Sabre in 2021, which is the largest bilateral combined training exercise between the ADF and the U.S. military.³⁸

Compared with its strategic allies, particularly the U.S. military, the ADF does not have a strong history or cultural memory of wargaming within PME. The current strategic security environment, punctuated by the blurring of the distinction between war and peace, and characterized by enduring conflict and competition, requires more intellectual effort to develop imaginative and innovative ideas to address contemporary security challenges. As previously discussed, the core characteristics of games and the benefits of using wargames for andragogy necessitate a reinvigoration of wargaming for PME in Australia. However, when compared to the U.S. military, the ADF is a small military force with limited resources. There are existing obstacles to enhancing the use of games for PME in the ADF that need to be addressed to ensure that wargaming for PME is effective and enduring.

OBSTACLES TO WARGAMING IN THE ADF

The ADF's wargaming amnesia means that there are scant foundations on which to establish a reinvigorated culture and framework for education in PME. This is further complicated by the practical constraints to effective wargaming and by the de-traction from using wargames due to the entrenched cultural stigma attached to them.

Sabin outlines three practical constraints that need to be addressed for the effective use of wargaming: expertise, time,

³⁷ Caffrey, *On Wargaming*, 240.

³⁸ See, for example, the data on the 2021 exercise at "Talisman Sabre 21," Australian Army, accessed 27 January 2022.

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and resources.³⁹ In an educational context, the most important of these is expertise, particularly the need for experienced and confident instructors skilled in the effective use of wargames to achieve learning outcomes.

Expertise and Instructor Buy-in

Sabin points out that it is difficult for nongamers to grasp or understand basic wargames. The price of entry to the experiential learning provided by wargames can be high.⁴⁰ ADF is in a Catch-22 situation: it needs more personnel experienced in wargames that can facilitate seminars and discussions that enhance learning via wargames; however, the ADF also needs to start using wargames in education to develop expertise in personnel who can then instruct and facilitate using games in education.

The way to overcome this gap is to just start using games in education as an alternative method for teaching, particularly when PME institutions have staff who are enthusiastic about games and are willing to both demonstrate their utility through trial and in assisting other instructors. These instructors with wargaming or broad gaming experience are rare and should be nurtured and developed when they are identified in ADF PME institutions.

Dr. Johan Elg goes further than Sabin. The presence of expert wargaming facilitators and instructors is one thing, but instructor buy-in is more important as it is a committed approach to the use of games in education. Elg defines instructor buy-in as “when an instructor has overcome perceptions of deficiencies in comfort, control and credibility when it comes to managing a specific game.”⁴¹ Significant investment in instructor development is required to build confidence in the use of games to enhance learning objectives. Instructor development

³⁹ Sabin, “Wargaming in Higher Education,” 337.

⁴⁰ Sabin, “Wargaming in Higher Education,” 337–38.

⁴¹ Johan Elg, “Instructor Buy-in: Pitfalls and Opportunities in Wargaming,” *Tidskrift* (April/June 2019): 7.

courses and guides are essential, particularly for incoming staff at PME institutions. For example, the development of a guide for the use of games similar to the *Facilitators Guide to Learning* developed by the Australian Defence College specifically for instructors at the Australian War College is an initiative that will assist with instructor buy-in.⁴²

Instructor buy-in is essential for learner buy-in because “the importance of learners’ perception of the instructor’s credibility by far surpasses the actual use itself of games regarding effectiveness of learning.”⁴³ Elg argues that having instructors provide logical explanations for the outcomes in wargames is essential for overcoming “gamer mode” (a concept by Anders Frank, cited by Elg, which means that players play the wargame to win rather than to learn).⁴⁴ Instructors are necessary to ensure the students make the logical link between the game and the learning outcomes.

Time

Minimizing the time to learn and play games is essential if they are used to complement traditional pedagogical methods such as lectures, readings, and seminar discussions.⁴⁵ When used in this manner, there may not be time to play entire games as part of a lesson plan, and it would be more useful for the instructor to play a scenario or snapshot of the game to demonstrate a concept or dynamic that is of relevance to the learning objective. For example, a few turns of the game *Twilight Struggle*, which has an average playing time of 120–80 minutes for experienced players, can be used to demonstrate some of the trade-offs that the adversaries faced to counter or prevent the dominance of the adversary in a particular line of effort: Do I focus my efforts on military operations in one or more regions,

⁴² *Facilitators Guide to Learning* (Weston Creek, AU: Defence Education Learning and Training Authority, Australian Defence College, 2020).

⁴³ Elg, “Instructor Buy-in,” 7.

⁴⁴ Elg, “Instructor Buy-in,” 9.

⁴⁵ Sabin, “Wargaming in Higher Education,” 337.

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or do I focus on winning the space race?⁴⁶ Is there any way to achieve both strategic goals?

Resources

Resource allocation refers to decisions on whether to invest in the purchase of myriad games (table top or computer), the development of bespoke games by talented individuals that are specifically designed for the needs of the ADF, and the instructor time in learning and effectively facilitating a wargame.⁴⁷ These various considerations require finding the right mix between the need to have wargames that can be delivered quickly within facility constraints and staff expertise and providing the students/players with a realistic experience in decision making.⁴⁸

The Stigma of Wargaming

The perception of wargames in academia significantly impacts their legitimacy as an educational tool, particularly as part of andragogy. Sabin argues that “the real problem underlying the limited use of wargaming in academia is less that it is impractical and more that it is poorly understood and viewed with real disdain.”⁴⁹ This necessitates an approach to increase understanding about the use of games to achieve learning outcomes. This approach involves holding open demonstrations and being clear that there is an element of trial and error when finding the right game to achieve the appropriate outcome for the learner. By contrast, there is little opposition to the lecture-focused approach in most ADF PME institutions and their assumed effectiveness, despite evidence to the contrary.⁵⁰ However, more work needs to be done to find the right bal-

⁴⁶ Estimate from Board Game Geek for *Twilight Struggle*.

⁴⁷ Sabin, “Wargaming in Higher Education,” 338.

⁴⁸ Sabin, “Wargaming in Higher Education,” 338.

⁴⁹ Sabin, “Wargaming in Higher Education,” 341.

⁵⁰ Mehdi Farashahi and Mahdi Tajeddin, “Effectiveness of Teaching Methods in Business Education: A Comparison Study on the Learning Outcomes of Lectures, Case Studies and Simulations,” *International Journal of Management Education* 16 (2018): 131–42, <https://doi.org/10.1016/j.ijme.2018.01.003>.

ance between experiential and traditional classroom methods for education. Wargaming is not relevant to every seminar or course. Wargames are only effective when educators and instructors understand their strengths and where they can most effectively contribute to learning:

Wargaming is simply one more technique, one more complementary perspective, with which to try to come to grips with the intractable problem of understanding the dynamics of human conflict. Rather than providing reliable answers, it is best at highlighting neglected questions. Rather than offering secure predictions, it is most helpful when it produces flawed or unexpected outcomes, since these force users to re-examine the assumptions programmed into the model and think about how it could be improved.⁵¹

PATHWAYS TO IMPLEMENTING WARGAMING FOR EDUCATION

The ADF currently suffers from a loss of wargaming corporate memory, but the ADC is considering several initiatives to reinvigorate the use of wargames for joint PME in Australia. The efforts of the ADC are underpinned by a few principles that will guide the reintroduction of wargaming into Australian PME:

- Games are merely another educational method. As such, they must be connected to the learning outcomes.
- Games have much to offer through abstraction. Take a broad approach to the type of game to use. There is no need to focus solely on traditional wargames or games that have only a military focus.
- Investment in instructional staff is the key to success. The ADC must assist its instructors through development and guidance to be confident and effective at using new educational tools, such as wargames, to enhance the education of all students at the ADC.

⁵¹ Sabin, "Wargaming in Higher Education," 344.

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- Invest in broadening awareness of games for education. This is important in overcoming the stigma attached to wargames. Create an inclusive and accessible wargaming culture at the ADC that encourages people new to gaming to participate and learn.
- Develop a wargaming network in Australia and the international PME community. This connects with other educational institutions using games for education, for exchanging ideas, and for remaining current on andragogical research on games for adult education.

These principles manifest in five broad lines of effort for ADC.

Line of Effort 1. Trial

Commence a 12-month trial period for using games in formal curricula. PME programs across the ADF are primarily founded on traditional methods of education such as lecture and seminar-based work, with limited use of games to allow students to explore concepts and historical accounts presented to them. Wargames are not appropriate in every case to achieve learning objectives. However, learning management plans can be developed to involve practical learning applications, where appropriate, through wargames. Courses at the Australian Defence College span from ab initio training at the Australian Defence Force Academy to the education of senior officers at the Australian War College. As previously noted, further analysis of each course's learning outcomes and wargaming is necessary to inform the decision to use wargames to enhance course learning outcomes.

ADC will also need to invest in instructor development and work with its contracted academic partners to develop the confidence and effectiveness of instructional and academic staff in the use of wargames to achieve learning outcomes. Another important consideration in the trial phase is to ensure that debriefing and reflection time for learners is built into the wargaming parts of the course. Periods of learner reflection

and feedback with instructors and other students is essential to consolidate the experiential nature of wargaming and to help students understand how the game connects to learning objectives.⁵²

Line of Effort 2. Establish an ADC Wargaming Society

Von Moltke established the Magdeburg Wargaming Club in 1828 when he was a lieutenant. The club served as a means for Prussian officers to play *Kriegsspiel* as part of their professional development outside of formal courses.⁵³ In this spirit, and harnessing Blamey's intention for wargaming to occur in officer's messes, ADC will establish its own Wargaming Society. The society is intended to connect professional and recreational gamers within the framework of education. Recreational and professional wargamers can provide complementary perspectives on how to use wargames for education, as Sabin states, "The two groups are highly complementary, and between them contribute a great deal to modeling and understanding warfare as a whole."⁵⁴

The society is intended to provide an avenue for professional interaction between students at all ADC residential courses, particularly at the Australian Defence Force Academy where recreational wargaming already occurs, and to provide an entry point for beginners. The Wargaming Society will also provide an experimental function that allows the members to identify games for play and advice about whether they think the game in question has a use within Australian PME. This trial and error method to finding appropriate games for education is part of Sabin's approach:

So where does my own educational employment of wargames during my 25 years as a war studies academic fit into this overall pattern? The story is essentially one of constant experimentation and in-

⁵² See Elg, "Instructor Buy-in"; and Hays, *The Effectiveness of Instructional Games*, 53.

⁵³ Lewin, *War Games*, 44.

⁵⁴ Sabin, *Simulating War*, 36.

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cremental growth, starting small and then building on whatever worked until wargaming became a crucial element within my overall teaching technique.⁵⁵

The Wargaming Society can also serve an educational function by providing beginners with an open and welcoming environment to try wargaming outside of formal PME courses. Through this function, the Wargaming Society has an advocacy function by showing, through demonstrations and encouraging participation, the utility of games for education. Sabin emphasizes this practical approach: “The most effective way of persuading people of the value of wargames is through direct hands-on experience.”⁵⁶

Line of Effort 3. Sponsor for Educational Wargaming

The Australian Army’s efforts to formally establish wargaming for training and education through Army Office Staff Instruction No. 17/84, “War Gaming in the Australian Army,” included the designation of an officer with the specific responsibility for wargaming. The staff instruction specified that the director general of army training was responsible for:⁵⁷

- Coordination and development of policy;
- Wargames used to assist in the development of exercise plans;
- Training wargames; and
- Duties of the training requirements advisor for war-game training.

The appointment of a sponsor for wargaming in education is essential to ensuring that wargaming has an enduring connection to Australian JPME and the courses delivered by ADC. Although not formally established at the time of this writing,

⁵⁵ Sabin, *Simulating War*, 36.

⁵⁶ Sabin, “Wargaming in Higher Education,” 347.

⁵⁷ See paragraphs 6–9 for “Responsibilities” in Army Office Staff Instruction No. 17/84, “War Gaming in the Australian Army.”

the most appropriate sponsor for wargaming in the ADF is the commander of the Australian Defence College, which is consistent with the commander's appointment as defense's education and training technical authority.

Line of Effort 4. Conduct a Defense Wargaming Seminar

As previously discussed, the Australian Army held a wargaming conference as part of that Service's efforts to incorporate wargaming into its formal training and education system during the 1970s and 1980s. The conference provided a formal avenue to discuss wargaming and to confirm its use as a tool for army education and training. Similarly, the ADC should host regular wargaming seminars and conferences to achieve two primary goals: first, provide a forum for identifying and synchronizing the currently disparate wargaming efforts throughout the Australian Defence Organisation; and second, allow for an avenue for regular, open discussion about key topics that inform the use of games for education in the military and to introduce defense audiences to academic, corporate, and defense industry perspectives on games for adult education and the latest tools available to assist with PME. This dedicated, ADC-hosted wargaming seminar will complement the annual Connections Oz conferences that bring together recreational and professional wargamers to share knowledge and experience and that enhance the use of wargaming for various purposes including education.⁵⁸ It should also serve as a repository for the conference proceedings to ensure that the insights and knowledge is preserved for future generations.

Line of Effort 5. Wargaming Network

There is a rich international network of wargaming societies and wargaming centers within the military forces and academia. The Georgetown University Wargaming Society, the U.S. Naval War College Wargaming Department, and the U.S.

⁵⁸ See "About," Connections Oz, accessed 14 July 2021.

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Marine Corps University's Brute Krulak Center for Innovation and Future Warfare are just a few of the international societies and centers that ADC should develop connections and partnerships with as it develops its own wargaming for education capability.⁵⁹ ADC can engage with these organizations to learn from their experience and exchange ideas, including future competitions between students and fellowships, as the ADF develops its expertise in the use of wargames for education.

CONCLUSION

The more people who are directly exposed to serious but accessible games, the less pervasive will be their image as trivial and childish diversions or impossibly complex and time-consuming pastimes for obsessive nerds. Playing wargames more widely offers the best chance of inspiring more use of this currently neglected approach to the study and understanding of war.

~ Philip Sabin⁶⁰

Strategic competition and warfare are human endeavors that are inherently uncertain, dynamic, and demand the best of human cognitive and physical performance. The difficulty is that the interplay between individuals, organizations, and nations in this environment is unforgiving and there are no opportunities to reset decisions made in this context. There is only one opportunity to make a relatively good decision in this challenging, high-pressure context. Wargames offer military personnel the opportunity to work in a safe-to-fail environment to practice decision making in a competitive context. Further, wargames offer military learners with the ability to interact with history, playing the role of commanders in battles long past, and ex-

⁵⁹ "About," GU Wargaming Society, accessed 14 July 2021; "About Wargaming," USNWC.edu; and "Brute Krulak Center for Innovation & Future Warfare," USMCU.edu, accessed 14 July 2021.

⁶⁰ Sabin, "Wargaming in Higher Education," 347.

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perience first-hand through the wargaming model some of the challenges faced by the commander in that context.

The use of games as part of PME also enhances the learning experience of students by providing them with a practical, discovery learning approach to understanding the course material. However, the use of wargames needs significant investment in time and resources. Most importantly, the key to success for the use of wargames is in obtaining instructor buy-in and developing the expertise in instructional staff so they are confident and effective in using wargames in PME programs.

The history of wargaming in the ADF is short, primarily focused on the efforts of the Australian Army in the 1970s and 1980s. However, efforts in the ADF have led to a much greater emphasis on computer simulation for collective training, with the use of wargaming for education diminishing over time. The Australian Defence College is focused on reinvigorating wargaming as an educational tool as part of the Joint PME courses offered at the college. The efforts to reintroduce wargaming into PME will require significant effort in the coming years through the incorporation of wargaming into the JPME system, with a key focus on instructor development, to ensure that the use of games is normalized and enduring.

The ADF cannot afford to enter another period of amnesia about wargaming. Phil Klay stated that “Joining the military is an act of faith in one’s country—an act of faith that the country will use your life well.”⁶¹ The formal incorporation of wargaming into PME will allow ADF leaders to develop the strategic thinking, innovative and creative approaches to problem solving, that will enhance their ability to make sound strategic decisions that will ensure that Australian lives and resources are used well in the national interest.

⁶¹ Phil Klay, “The Citizen-Soldier. Moral Risk and the Modern Military,” *Brookings Essay*, 24 May 2016.

Chapter Six

Make It Stick

Institutionalizing Wargaming at EDCOM¹

*Major Ian T. Brown, USMC;
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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."² 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.³

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

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.

² Gen David H. Berger, *Commandant's Planning Guidance: 38th Commandant of the Marine Corps* (Washington, DC: Headquarters Marine Corps, 2019), 19.

³ Director, Institutional Research, Assessment, and Planning, to Vice President for Operations and Plans, "Academic Year 2021 Institutional Effectiveness Assessment Report," 5 September 2021.

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.⁴ 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).⁵ 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.”⁶

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-

⁴ Col E. S. Maloney, “War Games: Key to Doctrine?,” *Marine Corps Gazette* 44, no. 11 (November 1990): 9–10; Col E. S. Maloney, “Modern War Gaming: State of the Art,” *Marine Corps Gazette* 44, no. 11 (November 1960): 10–12; Maj Frederic A. Green, “The Best Kind of War,” *Marine Corps Gazette* 48, no. 11 (November 1964): 32–35; Maj Edgar F. Musgrove, “No Game,” *Marine Corps Gazette* 49, no. 8 (August 1965): 53–56; Capt Douglas C. MacCaskill, “War Gaming: Tactical Training for Officers,” *Marine Corps Gazette* 57, no. 10 (October 1973): 18–23; 1stLt T. X. Hammes, “Combat Simulation for Next to Nothing,” *Marine Corps Gazette* 64, no. 3 (March 1980): 64–68; and LtCol P. D. Reissner, “It’s More than a Game,” *Marine Corps Gazette* 68, no. 3 (March 1984): 67–72.

⁵ Capt C. A. Leader, “The ‘TACWAR’ Wargame,” *Marine Corps Gazette* 65, no. 12 (December 1981): 24–26.

⁶ Capt Stuart W. Bracken, “Modifying TacWar for the Lean Times Ahead,” *Marine Corps Gazette* 76, no. 10 (October 1992): 44.

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making exercises “daily.”⁷ 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.”⁸ 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 war-game on their government computer.⁹

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-

⁷ *MCO 1500.55, Military Thinking and Decision Making Exercises* (Washington, DC: Headquarters Marine Corps, 12 April 1997).

⁸ Capt Michael J. Jernigan, “Marine Doom,” *Marine Corps Gazette* 81, no. 8 (August 1997): 19.

⁹ “MCO 1500.55,” Marine Corps Publications Electronic Library, accessed 26 March 2021. The order remains marked as “current.”

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,

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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.¹⁰ 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.¹¹ But “warfighting” was often conflated with “warfighting functions,” standardized in five-paragraph orders and exercises in the Marine Corps Planning Process (MCP). 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-

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.

¹¹ “CEME School and Course Descriptions,” College of Enlisted Military Education, Marine Corps University, accessed 2 April 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

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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.

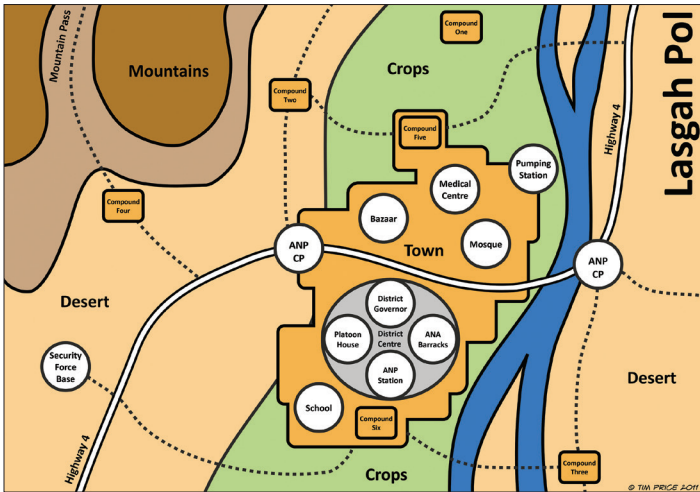
Both students and faculty rapidly gravitated to the game. Here, in a synthetic environment that could be set up or torn down in a matter of minutes, and not requiring expensive hardware or an army of facilitators, enlisted leaders could do a practical application of tasks to execute operationally from

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

<p>Security Force Commander:</p> <ul style="list-style-type: none"> - Improve Security. - Maintain Local National Primacy and avoid undermining the local forces. - Avoid Casualties. 		<p>Afghan National Police Chief:</p> <ul style="list-style-type: none"> - 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. 	
<p>Taliban Commander:</p> <ul style="list-style-type: none"> - Kill the Infidel! - Ensure the Taliban are recognised as a force for alternative Government. 		<p>Afghan National Army Commander:</p> <ul style="list-style-type: none"> - Be seen as heroic defenders of peace and prosperity. - Get as much as you can out of NATO (training, equipment, etc). - Improve security. 	
<p>District Governor:</p> <ul style="list-style-type: none"> - Maintain your position at all costs. - Improve Prosperity. - Improve Security. 		<p>Tribal Elder:</p> <ul style="list-style-type: none"> - Remove Western Influence. - Sell popples (It is the only way to maintain income). - Discredit the Governor. 	

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

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Figure 10. *Lasgah Pol* game pieces adapted for American tables of organization and equipment

ANA Platoon 	ANA Platoon 	ANA Platoon 	ANA Platoon 	ANA Platoon 	ANA Platoon 	
Platoon 1 	Platoon 2 	Platoon 3 	Platoon 4 	Platoon 5 	Platoon 6 	
MP Det 	Headquarters 	EOD Sqn 	HMG 	Javelin 	Sniper 1 	Sniper 2 
Engineers 	Engineers 	Medics 	Artillery 	Mortars 	Apache 	Fast Air 
Mastiff 1 	Mastiff 2 	Mastiff 3 	Mastiff 4 	Mastiff 5 	Mastiff 6 	UAV 
ANP Section 	ANP Section 	ANP Section 	ANP Section 	ANP Section 	ANP Section 	
Civilian 	Civilian 	Civilian 	Civilian 	Civilian 	Civilian 	
Explosion 	Explosion 	Explosion 	Explosion 	Explosion 	Explosion 	Explosion 
Taliban IED Team 1 	Taliban EID Team 2 	Arms Cache 	Arms Cache 	Explosive Cache 	Explosive Cache 	Chinese 107mm RKT 
Taliban 1 	Taliban 2 	Taliban 3 	Taliban 4 	Taliban 5 	Taliban 6 	

Source: courtesy of John Curry and Tim Price, History of Wargaming Project, adapted by GySgt Dathan Byrd.

Figure 11. Career Course students playing *Lasgah Pol*



Source: courtesy of GySgt Dathan Byrd.

Warfighting.¹⁵ 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

¹⁵ 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.

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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.”¹⁶ Different program, different outcomes, but the same requirement levied by the CPG: use wargaming to fill deficiencies in decision-making opportunities against thinking adversaries.¹⁷ The challenge

¹⁶ “Expeditionary Warfare School: Course Description,” USMCU.edu/EWS, accessed 29 March 2021.

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

¹⁸ The initial discussion of this eventual collaboration was through text messages and phone calls with Sebastian Bae and the authors.

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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.¹⁹ 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."²⁰ 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).²¹ 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

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.

²⁰ Megan Eckstein, "Berger: Marines Focused on China in Developing New Way to Fight in the Pacific," *USNI News*, 2 October 2019; President Joseph R. Biden Jr., "Interim National Security Strategic Guidance," *WhiteHouse.gov*, 3 March 2021; and "Secretary Lloyd J. Austin III Message to the Force," Department of Defense, 4 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.

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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.²² Bae’s team, Krukak 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

²² Jack Murphy, “Former Marine Invents War Game to Cultivate Tactical Thinking in the Corps,” *Audacity*, 6 December 2021.

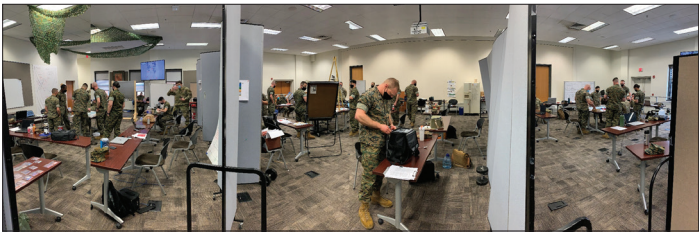
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Figure 12. Early playtesting of *FMF: INDOPACOM*



Source: courtesy of Maj Ian T. Brown.

Figure 13. Simultaneous gameplay of *FMF: INDOPACOM* by EWS students



Source: courtesy of Maj Ian T. Brown.

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

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the classroom.²³ 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.²⁴ The authors would like to note that the

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.

²⁴ "Marine Corps Command and Staff College," USMCU.edu, accessed 29 March 2021; and "School of Advanced Warfighting," USMCU.edu, accessed 29 March 2021.

exercises conducted by SAW and the Training and Education Command Warfighting Society described in the following paragraphs are not all-inclusive of their historical wargaming efforts, but intended to capture those efforts undertaken in the context of the 2019 CPG.²⁵

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.”²⁶ There, again, was that “greatest deficiency” identified in the CPG, and CSC and SAW would use wargames to correct it.²⁷

A key requirement for using wargames was maintaining the continuity of exercises that already exist within the schools’

²⁵ For other wargaming efforts conducted at SAW, see Benjamin Jensen and Matthew Van Echo, “You Can Teach a Marine Deterrence: Understanding Coercion Requires Changing PME,” *War on the Rocks*, 4 June 2020. Background on the Training and Education Warfighting Society may be found at Benjamin M. Jensen, “TECOM Warfighting Club: Bringing Together Warfighting Communities of Interest,” *Marine Corps Gazette* 103, no. 6 (June 2019): 8–10. The results of the Warfighting Society’s exercises in 2021 are outlined in Benjamin Jensen, “The Crisis: Operations in the South China Sea,” *Marine Corps Gazette* 105, no. 3 (March 2021): 74–76; Benjamin Jensen, “The First Battle: Operations in the South China Sea,” *Marine Corps Gazette* 105, no. 3 (March 2021): 77–80; Benjamin Jensen and Maj Robert Spodarek, “The Second Battle: Operations in the South China Sea,” *Marine Corps Gazette* 105, no. 4 (April 2021): 87–91; and Benjamin Jensen, “The Third Battle: Operations in the South China Sea,” *Marine Corps Gazette* 105, no. 5 (May 2021): 80–83.

²⁶ LtCol Matthew Van Echo, correspondence with author, 29 March 2021.

²⁷ Berger, *Commandant’s Planning Guidance*, 19.

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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)*.²⁸ 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.²⁹ 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-

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.³⁰ 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

³⁰ The white cell for CSC's *Pacific Challenge III* exercises consisted of one game controller and four military faculty.

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Figure 14. Command and Staff College's *Pacific Challenge III* wargame used TOAW IV to develop student proficiency in staff actions at the MEF level

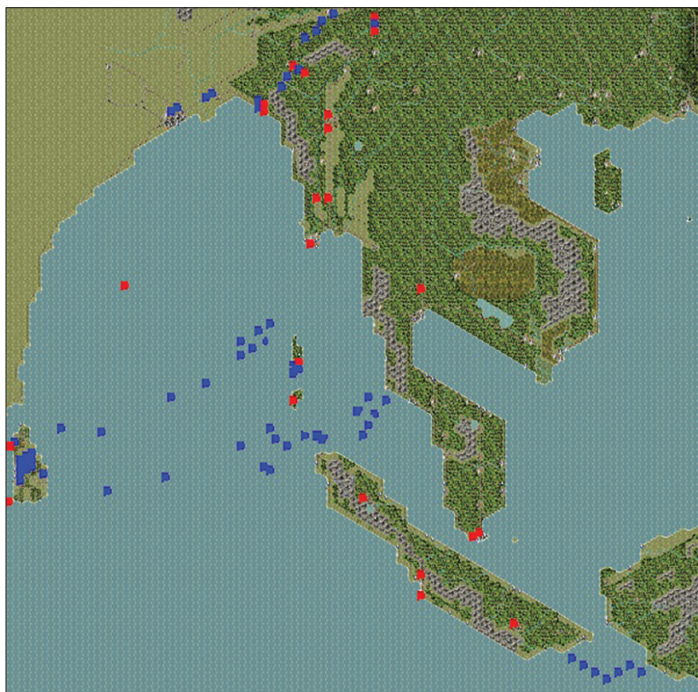


Source: courtesy of Capt Benjamin Herbold.

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.

Figure 15. SAW used *TOAW IV* in the Singapore Sling exercise to test the flexibility and quality of operational plans in the India/Burma theater of World War II



Source: courtesy of Capt Benjamin Herbold.

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

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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."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.

BEYOND THE CLASSROOM

Projects, Partners, and Tournaments

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

³¹ Gordon Rudd email to Mike Morris and Matthew Van Echo, 27 January 2021.

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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.

³³ *Command: Modern Air/Naval Operations* (Epsom, UK: Matrix Games, 2014).

³⁴ As first described by Gen Robert B. Neller in *Marine Corps Operating Concept: How an Expeditionary Force Operates in the 21st Century* (Washington, DC: Headquarters Marine Corps, 2016), 13.

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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 multi-player 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.

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Figure 16. Screenshot from the *Command* scenario used for the TECOM Warfighting Society exercise with the decoy target drone swarm (center)



Source: courtesy of Maj Ian T. Brown.

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.³⁶ 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

³⁶ See "The Dance of the Vampyres," in Tom Clancy, *Red Storm Rising* (New York: Berkley, 1987), 227–55.

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-

³⁷ Berger, *Commandant's Planning Guidance*, 11.

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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

³⁸ "EWS AY19–20 12th Marines Wargame After Action Report," 12 March 2020.

MAJ IAN T. BROWN AND CAPT BENJAMIN M. HERBOLD

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.³⁹ Indeed, the AY21 Innovation Summit featured several student projects that used wargames as their research mechanism.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.

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Figure 17. Students plan and play on DARPA's *PROTEUS* wargame software during the AY20 Sea Dragon tournament



Source: courtesy of Maj Ian T. Brown.

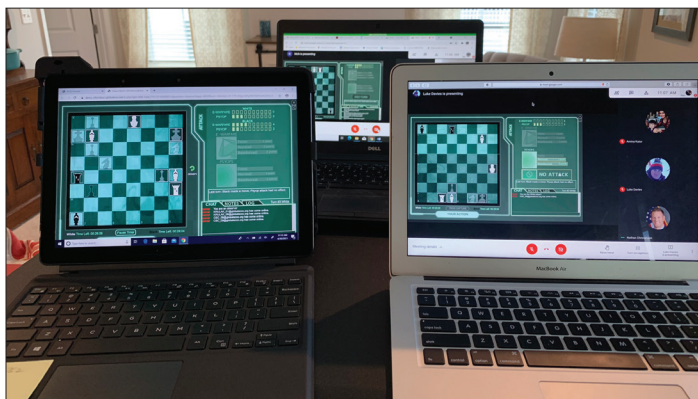
different game type. Sea Dragon's first iteration used a tabletop game from GMT's *NextWar* series.⁴¹ In AY20, the center partnered with the Defense Advanced Research Projects Agency (DARPA) to use their *PROTEUS* (Prototype Resilient Operations Testbed for Expeditionary Urban Scenarios) software, which was a real-time tactical game that modeled DARPA's "mosaic warfare" concept in an urban environment.⁴²

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,

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).

⁴² "PROTEUS Transitions to Marine Corps Warfighting Lab," DARPA.mil, 22 June 2021. For a longer discussion of the mosaic warfare concept, see "DARPA Tiles Together a Vision of Mosaic Warfare," DARPA.mil, accessed 28 January 2022.

Figure 18. Improvised setup for the execution of *InfoChess* during the AY21 Sea Dragon tournament with the students playing from home, using their own computing devices, and coordinating via Google Meet



Source: courtesy of Maj Ian T. Brown.

in-game strategizing, and battle tracking.⁴³ *InfoChess* combines basic chess rules with many of the challenges discussed at the highest level of the Marine Corps in the CPG and *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.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

⁴³ *InfoChess* (Monterey, CA: Global ECCO, 2010).

⁴⁴ *Force Design 2030* (Washington, DC: Headquarters Marine Corps, 2020).

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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.

Chapter Seven

Wargaming

Sponsor Education

Jeff Appleget, PhD; and Robert Burks, PhD

INTRODUCTION AND BACKGROUND

To understand a perspective on sponsors, the authors first share their experiences upon which they have based their observations. Each organization in the Department of Defense (DOD), or those that work with the DOD, that does wargaming has a unique approach. Just as no two wargames are alike, no two wargaming sponsors are alike. The authors first provide the context from which they have built their shared vision of sponsors. They then describe the challenges they see with today's DOD wargaming sponsors. After outlining the key tenets of the sponsor education process they developed during the last decade for the sponsors of wargames, the authors then provide their recommendations on educating DOD wargaming sponsors writ large, building on experiences with wargaming sponsors and also leveraging experience teaching wargaming throughout the DOD and around the world with defense allies and partners.

NAVAL POSTGRADUATE SCHOOL WARGAMING PROGRAM

The wargaming program at the Naval Postgraduate School (NPS) in Monterey, California, is fairly unique when compared to other organizations that teach and conduct wargaming. For example, the staffing of the wargaming enterprise differs greatly from that of its larger cousin, the Naval War College (NWC) in Newport, Rhode Island. While NWC has no less than four differ-

ent wargaming organizations (Wargaming Department, Halsey Alpha and Bravo Research Groups, and CIPI Gravely Program) with wargaming staff, faculty, and contractors that number more than 100 personnel, the NPS Wargaming Center consists of two faculty and a research associate. Despite the small size, NPS conducts 5–15 sponsored wargames annually, predominantly for DOD or defense partner organizations. The Wargaming Center has conducted more than 80 sponsored wargames in the last 12 years for 65 different organizations.

The pool of talent largely responsible for the design, conduct, and documentation of the wargames are the NPS graduate students predominantly from the Operations Research and Defense Analysis curricula. Most of these students are midgrade military officers who have been on active duty anywhere from 6 to 12 years and come from all U.S. Services and defense allies and partners. Before they set foot in the class to take the Wargaming Applications course, they may not have seen or participated in a wargame or, if they do have wargaming experience, that experience can vary greatly.¹

The genesis of a typical NPS wargame begins with the 11-week Wargaming Applications course that is designed to teach wargaming using a learn-by-doing model. The faculty organize the students into teams of 4–6 students, each working for a real-world sponsor. The first six weeks consist of the formal education process that includes reading papers, viewing recorded lectures, and completing a series of assessments to track their progress. On week one, the students are introduced to wargaming. On week two, each team has their first sponsor engagement, where they learn about the wargame they will design, conduct, and analyze for their sponsor. During weeks two through six, the teams initiate and engage with their sponsor, developing the foundational products for the construction of the sponsor's wargame. Once they pass their Wargaming

¹ "Operations Analysis (OA)—Curriculum 360," NPS.edu, accessed 31 January 2022; and "Operations Research (OR) Curricula," NPS.edu, accessed 31 January 2022.

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Apprentice Certification Exam on week six, and the wargaming teams' foundational products are refined and finalized, they devote the next four weeks to completing the design and development of the wargame. Sometime during week 11, the wargame is conducted for the sponsor. After analyzing the wargame's data, the students then brief results back to the sponsor, and write an executive summary and wargame report to document their wargame.

NPS also supports wargame development through week-long wargaming courses and workshops conducted by the NPS Mobile Education Team (MET). The team travels to the sponsoring organization's location and mentors a group of 16–20 students from Monday's sponsor in-brief to Friday's wargames, designed and conducted by teams of students who have created a wargame as they are learning wargaming, just as the resident course students would. The goals of these courses and workshops are twofold. First, NPS helps the organization build a cadre of wargamers who, after the weeklong engagement, have experienced the initiation, design, development, execution, and analysis of a wargame in 40 hours of instruction and hands-on practical exercises. Second, if the organization has wisely chosen the wargaming topic that the students work on throughout the week, the organization will already have the foundation of a wargame created and demonstrated that they can build on to address wargaming needs in the months ahead. Just as with the resident course, the sponsoring organization of the MET provides the wargaming topic that the students work on throughout the week, with the students engaging the sponsor on Monday, reengaging on Wednesday, and then conducting the wargame for the sponsor on Friday.

NPS WARGAME SPONSORS

Introduction

DOD wargaming sponsors come from a variety of organizations. The Joint Staff, Service components, combatant commands, and other flag-level major commands all use war-

gaming as well as other tools to better understand the threats the nation faces today and to better prepare for the threats of the future. The background and wargaming experience of the sponsors can vary greatly, ranging from active duty to defense civilians and midgrade to flag rank equivalent. They may have had little to no experience with wargaming; however, most believe that a wargame is a simulation of some aspects of military and/or government endeavor.

Since NPS students are destined to return to their respective Services as defense analysts, the faculty want them to experience as close to a real-life sponsor encounter as possible during the wargaming course to prepare them for the future. It has been the authors' experience that many defense sponsors only have a vague idea of what a wargame is, and if you asked them the difference between a wargame and a closed-loop combat simulation, some would struggle to distinguish between the two. A few may even offer that a closed-loop combat simulation is simply a computerized wargame. While the 2015 U.S. DOD reinvigoration of wargaming by then Deputy Secretary of Defense Robert O. Work has served to help educate many senior leaders about wargaming, the notion that "wargaming would be better if we just automated it all" is still found in the Pentagon, in combatant commands, and throughout the Services.²

CHALLENGES WITH TODAY'S DOD WARGAMING SPONSORS

Many senior leaders today do not have a good understanding of what wargaming can contribute to their organization. There are several reasons for this.

First, wargaming has been all but abandoned as a professional development tool for warfighters. Commanders used to devote time to wargames that allowed senior leaders to pass on war planning and warfighting lessons to their subordinates.

² Robert O. Work memorandum, "Wargaming and Innovation," Deputy Secretary of Defense, 9 February 2015.

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Much like the Prussians' *Free Kriegsspiel*, good leaders would test their junior officers and noncommissioned officers by having them wargame plans before field exercises and deployments, assessing and updating their subordinate's professional knowledge through mentoring.³ Today, that rarely occurs.

Second, wargaming has been given short shrift as a planning tool. The Cold War offered two fairly static major areas of operation (AOR) for nearly 40 years, where the nation planned to fight: Korea and Europe. From the mid-1950s until the Berlin Wall fell, not much changed in these areas, so war plans did not need extensive updating, hence little wargaming of these AORs occurred.

Third, with the rise of the computer-based combat simulations championed by the analysis and training communities, wargaming was seen as an outdated tool whose time had come and gone. Operations research analysts embraced and oversold the combat simulation as their flagship analytic tool, and many became advocates for purely quantitative analysis tools, neglecting the need for warfighters to leverage wargaming to develop robust concepts of operations that ensured operationally relevant scenarios were instantiated in combat simulations.⁴ This, coupled with the ever-increasing digitization of day-to-day lives, has led many senior leaders to believe that digitization makes everything better.

Often wargaming sponsors do not know that there are different *purposes* for conducting wargames, and these sponsors struggle to communicate what the objective of the wargame is, to include the primary target (players or sponsor) of the wargaming effort they wish the NPS team to address.

EDUCATING WARGAMING SPONSORS

NPS then works to educate the sponsors on the basics of war-

³ Verdy du Vernois, *A Simplified War Game*, trans. Eben Swift (Kansas City, MO: Hudson and Kimberly, 1897).

⁴ Jeff Applegate and Fred Cameron, "Analytic Wargaming on the Rise," *Phalanx* 48, no. 1 (March 2015): 28–32.

gaming much as with new wargaming students. They need to understand the strengths and weaknesses of wargaming and combat simulations as analytic tools, the different purposes of wargames, and the sponsor engagement process that allows the sponsor and the wargaming team to develop a shared vision of the problem that the wargame will be designed to address.

WARGAMES AND COMBAT SIMULATIONS

NPS educates sponsors six weeks to six months before they engage the students by sending them three pages of guidance. First, NPS wants to ensure they know the difference between wargaming and what the authors call “simulation studies.” Wargames focus on human decision making and produce largely qualitative results, such as concepts of operations or risk assessment of courses of action. Wargames are very useful in understanding how commanders may fight different force structures with different concepts of operations. Quantifying how well each force structure may fight is better suited to simulation studies. Simulation studies use closed-loop, computer-based combat simulations to produce large amounts of quantitative data. This data is then used to statistically compare the attributes of different force alternatives. In the context of a campaign analysis, wargaming and simulation studies are used together. Wargaming is used to determine *how* each force alternative fights (i.e., concepts of operations and employment or courses of action), and then the simulation, after instantiating how each alternative fights in the simulation, is used to determine *how well* each force fights, comparing the alternatives’ force effectiveness using quantitative measures of effectiveness and performance.

WARGAMING PURPOSES

NPS then educates the sponsor to the different purposes of defense wargaming. This is vital for them to understand so they can better communicate to the students their wargaming

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needs. The authors see three primary purposes for wargaming used in defense: analytical, educational, and experiential.

The purpose of an educational wargame is to educate the players. It may introduce them to new concepts or technologies, new doctrine or tactics, or a new region of interest's geography and adversary. The series of War Plan Orange wargames at the Naval War College from 1919 to 1940 immediately comes to mind as an example of educational wargaming.⁵

The purpose of an experiential wargame is to provide the players with experience. While that sounds similar to an educational wargame, an experiential wargame is crafted to allow the players to experience a specific role in a simulated environment to improve their ability to function in that same role in a similar real-world environment. Think of having a command and staff plan and execute simulated combat missions prior to a real-world deployment. The U.S. Army's Mission Command Training Program conducts wargaming to prepare commands and staffs for overseas deployment.⁶

The purpose of educational and experiential wargames is closely related in that the primary focus of the wargame is to impart something to the *players*—education or experience. The analytical wargame differs from these two purposes because the analytical wargame is focused on imparting something to the *sponsor* of the wargame. Most of the wargames conducted at NPS are analytical wargames.

An analytical wargame is designed to produce the information that allows the wargaming team to provide insights or findings from the wargame to the wargame's sponsor. To begin the wargaming process, the sponsor provides the wargame's objective and specifies several key issues that the wargame must address. The wargame is then constructed to allow its players to produce the information that the wargaming team

⁵ Michael Vlahos, "Wargaming, an Enforcer of Strategic Realism: 1919–1942," *Naval War College Review* 39, no. 2 (1986): 7–22.

⁶ "Mission Command Training Program (MCTP) Overview Brief" (brief, Col John M. McHugh Training Center Leavenworth, KS, 28 July 2020).

needs to then analyze, ultimately concluding in the formulation of the findings and insights for each of the sponsor's key issues. While choosing the players with the proper background is vital to the success of the wargame, there is no expectation that the wargame needs to be constructed to impart any experience or knowledge to the players.

Planning wargames are a particular type of analytical wargame where the objective is to test several courses of action in order to select the best one from which to develop a plan. *Joint Planning*, Joint Publication 5-0, outlines wargaming's role in the seven-step planning process and prescribes a wargaming methodology called action-reaction-counteraction for constructing the wargame's moves.⁷ While NPS faculty have some pedagogical reservations about the robustness of the methodology, at least the combatant commands are applying ANY rigor to wargaming as they complete the planning process. The authors strongly suspect many planning wargames are nothing more than hastily organized check-the-box events (or BOPSATs, bunch of people sitting around talking) that confirm the commander's favorite course of action is indeed brilliant.

SPONSOR ENGAGEMENT PROCESS

The authors advocate for a series of sponsor engagements between the sponsor and the wargaming team to come to an understanding of the amount of effort required. The ultimate goal of this engagement is the production of the sponsor proposal agreement, which can also be thought of as a sponsor contract, although NPS shies away from using the word *contract* as sponsors would then want to get their organization's legal team involved in reviewing contracts.

The authors encourage the sponsors *not* to scope the wargame to something they believe the students can accomplish. Their experience with real-life sponsors (both authors served as operations research analysts on active duty for many years)

⁷ *Joint Planning*, Joint Publication 5-0 (Washington, DC: Joint Chiefs of Staff, 2020), V-31.

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Table II. Wargaming purpose

<i>Purpose</i>	<i>Focus</i>	<i>Product</i>	<i>Example</i>
Analytical (general)	Sponsor	Insights and findings for sponsor's objective and key issues	Develop a concept of operations for a force fighting with new technologies
Analytical (planning)	Commander	Multiple courses of action (COAs) each wargamed against the enemy's most likely and most dangerous COAs	Develop a plan to respond to an adversary's aggression against an allied nation in a combatant command's AOR
Educational	Player	Produce better educated players	Introduce players to a new geographic area, concept, or technology
Experiential	Player	Provide better experienced players	Allow players to practice decision making in their actual positions in a conflict scenario

Source: compiled by the authors.

is that sponsors often have no idea what is involved in creating and conducting a wargame. When the sponsor states their wargame's objective and key issues, they may not know if they are asking for weeks, months, or even years of effort. NPS wants the students to experience this firsthand. The challenge many military officers face is that they have worked for military leaders their entire career. Those leaders typically understand what resources their subordinates have at their disposal, and thus they give them tasks that can be addressed with the resources on hand. DOD sponsors of analytical efforts typically do not understand the resources required or the resources on hand and may have little knowledge of other analytical requirements competing for the same resources. Unless the wargaming team provides some boundaries on what can be achieved, the team will agree to six months of wargaming that must be completed

in 11 weeks, setting the stage for disappointment and frustration on the part of all involved.

THREE SPONSOR INTERACTIONS

The sponsor proposal agreement is informed by a minimum of three sponsor engagements. The initial engagement on week two is where the sponsor describes the wargame they want the student team to design, conduct, and analyze. The briefing also may include information about the sponsor's organization and indicate why the organization needs the wargame to be conducted.

After this first engagement, the NPS wargaming team meets with the goal of understanding the sponsor's objective and issues. They may rewrite the objective and issues so that they are more easily understood by the team. The team will also identify any constraints and assumptions they heard from the sponsor and record those. They may begin development of a lexicon to ensure that DOD buzzwords that are currently in vogue are clearly understood by the sponsor and team. Finally, the team identifies the requests for information (RFIs) that will go back to the sponsor for action. Once all this is completed, the team will schedule the second sponsor interaction.

The purpose of the second interaction is clarification—did the team understand what the sponsor wants? The sponsor and team need to agree on the objective and issues so there is no misunderstanding about what the team is tasked to do. Terms that need clarification should be agreed to as well. If the sponsor and team have not worked together, the authors discourage any attempt by the team to scope the wargame at this point. At most, the team may offer a prioritized set of issues to the sponsor to see if the team's assessment matches that of the sponsor. This prioritization would then be used by the team for the third, scoping engagement if necessary.

The third engagement can be the most difficult as it is likely that the team will tell the sponsor that some of their issues may need to be treated less rigorously than others, or per-

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haps even dropped from the wargame. The wargaming team is obligated to prepare for this organization by taking each of the sponsor's key issues and determining the amount of effort the wargame will require to address each issue, which is made when the team drafts the initial Data Collection and Management Plan (DCMP). The DCMP forms the foundation on which the wargame will be constructed. Each of the sponsor's issues will be decomposed into its constituent essential questions (EQs). Each of these EQs need to be answered if that particular sponsor issue is to be fully addressed in the wargame. Some of these EQs may be answered through preliminary research, and some will be answered by the wargame itself.

Scoping the wargame cannot take place until the amount of effort each issue will take to address has been estimated by this process.

Scoping Techniques

NPS teaches the students two techniques that can be used to bring the sponsor to an understanding of the amount of effort the wargaming team may exert on the sponsored wargame. The first is what we call the analyst business model, which presents the three attributes: good, fast, and cheap.

The sponsor can have any two at the expense of the third. For example, if the sponsor wants a quality wargame (good), designed and conducted in a short amount of time (fast), then a large quantity of resources will need to be expended (expensive). For the student teams, there is usually no option to throw additional resources at the problem, so the analyst business model is something that will be more useful later in their career.

The faculty require students to create a list of constraints, limitations, and assumptions (CLAs) for the wargame. These CLAs are a formalized method of communicating the quality of the wargame the team can produce for the sponsor.

The constraints originate from and are imposed by the sponsor. Time is a universal constraint, where the game must be completed and results documented before a given date.

Academically, the time is also a function of the end of the NPS academic quarter. Other constraints a sponsor may impose include the use of a specific scenario or certain players.

Limitations represent an inability of the wargaming team to completely address the sponsor's issues. They may include a lack of subject matter expertise to design the game or the lack of experience the pool of players they have recruited can bring to the table. Wargames across the DOD typically struggle to ensure the adversary is well played. Constraints may impose limitations, such as the constraint of time minimizing the amount of key issues that the team's wargame can address. Limitations need to be revealed to the sponsor so they understand the limitations' effect on the quality of the wargame's outputs. The sponsor may be able to mitigate some limitations by providing the team additional resources, such as access to subject matter experts, players with the right pedigree from their organization, and perhaps funding to recruit experienced adversary players to the wargame.

Assumptions are statements that are taken as true in the absence of facts. Some assumptions originate from the sponsor, usually describing the environment within which the wargame is to be conducted. The wargaming team may need to make additional assumptions. Often these assumptions are made to better focus players on the wargame's primary issues. Cold War studies focused on analyzing future force structure requirements usually assumed that nuclear weapons would not be used, as this would unnecessarily complicate and obfuscate the analysis.

Most study team limitations need to be accommodated by assumptions. For example, a limitation for a wargame focusing on new technology may be a lack of operational performance data. The accompanying assumption may be that operational test data is a reasonable surrogate for operational performance data.

The CLAs included in the sponsor proposal agreement are

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only the initial draft. The CLAs will mature during the course of the wargame's development, and they must be revisited with the sponsor periodically. The final version of the CLAs needs to be *accepted* by the sponsor to ensure that both sponsor and team agree and to ensure that the wargaming team has not “assumed away” a key aspect of the wargame the sponsor wants examined.

The authors do manage the sponsors' expectations about the length of the actual wargame that their student teams will conduct for them. As the NPS students are taking the Wargaming Applications Course, they will also be taking between two and four other courses and they also may be working on their theses, so producing a wargame for the sponsor is not the only task they have to complete in 11 weeks. NPS wargames are small, usually fewer than 20 participants. The typical NPS wargame will take 8–12 hours of actual game time, and is usually executed during a three-day period, which also includes in briefs, game socialization, and postgame analysis.

SPONSOR PROPOSAL AGREEMENT

The sponsor proposal agreement is between the sponsor and the NPS student team. The agreement is signed by both parties by the end of week four. The agreement includes the wargame's objective and the sponsor's key issues. The wargaming team provides the sponsor with the initial draft of the constraints, limitations, and assumptions as an appendix to the agreement. The agreement also indicates who has accepted the responsibility to provide the scenario of the wargame and who is responsible for recruiting the players.

The sponsor proposal agreement, once completed, ensures that the development of the wargame will be properly focused and will have a reasonable chance of adequately addressing the sponsor's key issues. While no agreement can prevent what in the DOD is affectionately known as *mission creep*—adding tasks to be completed after the end of the problem definition

phase—the agreement does provide a point of departure that the wargaming team can use to negotiate with the sponsor in an attempt to keep the wargame on track if the sponsor needs to add tasks after the agreement has been signed. The general idea is that the agreement has specified the amount of effort that the wargaming team can expend within the allotted time frame on behalf of the sponsor. If another task is added, then a task needs to be removed from the original agreement. A reasonable sponsor will appreciate this and will work with the team. In the larger DOD world, not all sponsors are reasonable.

Sponsor Wargaming Proposal Agreement Example

The following wargame proposal is agreed to by the undersigned.

Sponsor objective and issues:

Wargame objective: Analyze Atlantic Fleet operations in support of NATO

Wargame issues to be examined:

- Assess the ability of the Atlantic Fleet to safeguard convoys
- Assess the ability of the Atlantic Fleet to conduct anti-surface warfare
- Assess the ability of the Atlantic Fleet to conduct antisubmarine warfare
- Assess the ability of the Atlantic Fleet to engage selected operational targets ashore
- Assess the ability of the Atlantic Fleet to engage selected strategic targets ashore
- Assess the ability of the Atlantic Fleet to conduct amphibious operations

Wargame details:

- Wargame scenario provided by sponsor (Baltic Scenario)

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- Players recruited/provided by sponsor (representatives from Atlantic Fleet command group and principal staff elements)

Time line:

- Date of sponsor/wargaming team interim progress review (IPR): 1 May 2022
- Dates the wargame will be executed: 6–8 June 2022
- Date the analysis brief will be provided to sponsor by wargaming team: 14 June 2022
- Date the executive summary, final, report and all wargame materials provided to sponsor: 17 June 2022

Draft key constraints, limitations, and assumptions (CLAs):

Constraints: wargaming team will have 10 weeks to design, develop, conduct, analyze and document the wargame

Limitations: the team does not have a subject matter expert on the NATO adversary to advise on wargame design

Assumptions: an adversary subject matter expert will be provided by Atlantic Fleet

Sponsor representative signature

Wargaming team lead signature

EDUCATING DOD WARGAMING SPONSORS

Introduction

Since many of the NPS wargaming sponsors come from the DOD, the authors believe their sponsor engagement protocols are useful for any wargaming team working for a DOD sponsor. Several years ago, when the authors were teaching one of their first MET courses, a student, who was a DOD civilian and former military, was incredulous that the faculty thought spon-

sors did not clearly define the problem. With more than 15–20 years working as uniformed operations research analysts, the authors have had many firsthand encounters with DOD analysis sponsors. DOD sponsors typically are not analysts, so they often have little to no appreciation for the amount of time required to perform analytic studies, including wargames. A former director of the Army's Training and Doctrine Command Analysis Center was routinely called on a Friday night by their boss, the four-star officer of the command, and asked to "do some runs" of a simulation over the weekend and brief them on Monday. The analysis effort the commander was asking for during a weekend actually represents weeks if not months of preparation and analytic effort.

The authors realize that the NPS wargaming program does not provide a venue that can answer every wargaming requirement across the DOD. Large and lengthy wargames are not something that can easily be accomplished with the current NPS wargaming model that relies on students with an 11-week time line. However, the authors are confident that the sponsor education and engagement processes outlined here will serve any DOD wargaming enterprise well. As they have taught wargaming across DOD organizations through the Mobile Education Team courses and workshops, the authors have had a chance to engage those organizations to learn of their unique wargaming requirements, their current wargaming models and practices, and the wargaming challenges that they face. NPS graduates often reach back to NPS when they encounter wargaming challenges in their assignments, so the authors find themselves involved in many DOD organizations' wargaming enterprises either as ad hoc advisors or under more formal arrangements, such as bringing a MET to a DOD organization to build a resident cadre of wargaming expertise. The authors' observations and recommendations that follow are based on their interactions with DOD sponsors outside of the NPS wargaming activities.

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WARGAMING IMPROVEMENT REQUIREMENTS

One area that needs improvement is the availability of educated wargamers. Unfortunately, because of the Cold War and other factors, there are very few wargamers to be found in the DOD today, so senior leaders cannot rely on their subordinates to provide the command with wargaming expertise. Some combatant commands have hired a few contractors, typically retired officers, as the command's sole wargaming expert. It has been the authors' experience that the wargaming knowledge of these contractors can vary greatly. Even if they are expert wargamers, there are too few of them to ensure a robust, relevant wargame is developed and conducted. Until the DOD professional military education system educates officers on wargaming creation, commands will need to bring in wargaming education teams to educate a cadre of wargamers for the command. This may well be a recurring requirement as active duty wargamers will rotate in and out of the command. Every major staff element in a combatant command should have at least two wargamers who can represent the staff section in the design and execution of a major wargame. Senior leaders need to inventory their current cadre of wargamers and act to ensure their organization has a sufficient number of proficient wargamers and a resourced wargaming education plan to ensure wargaming proficiency is maintained.

Because of this lack of resident wargaming expertise, many commands have outsourced some of their wargaming requirements to external organizations. Several of these organizations do conduct quality wargames; however, they are also expensive, and these wargames take time and planning. Relying on outsiders for an organization's routine wargaming requirements should really be seen as a stop-gap measure until an organization can develop a robust and responsive in-house wargaming capability.

During times when DOD combatant commands were flush with contingency funds, it was common practice to hire outside organizations to design and conduct wargames on be-

half of the command. However, if senior leaders lack the knowledge to design and conduct relevant wargames, it is difficult if not impossible for those leaders to supervise the design of quality wargames by others, whether outside organizations or internal ad hoc wargaming teams formed for specific wargaming requirements. Senior leaders need to be able to conduct quality control supervision of outside organizations that are designing wargames for the command.

Wargaming sponsors sometimes have no idea what resources are required to produce a quality wargame. This can be especially problematic when sponsors task their staff to produce wargaming results within a week of a wargaming tasking because that is all the time they had been given. The old phrase, “if you want it bad, you will get it bad,” comes to mind here.

Senior leaders need to understand what they need from a wargame, and how much time a wargame will take to produce what they need.

Often sponsors have a clear understanding of the problem, but they struggle to clearly communicate it to others. Sometimes they do not have a clear understanding of the problem, and need others to help them converge on a clearly defined problem statement. Staff officers and integrated product team (IPT) leads can be their own worst enemies in that they sometimes hear a vague or poorly communicated problem from a sponsor and instead of reengaging the sponsor to clarify the problem definition, they reimagine the problem into something that they know how to address and rush off to begin a staff effort that, in the end, will not address the problem the sponsor really needed help with. The sponsor engagement process outlined in *The Craft of Wargaming* needs to be used here, and the senior leaders need to embrace, encourage, and plan for this sponsor engagement process instead of forcing the staff officers or IPT leads to beg for more senior leader guidance.

The above-mentioned challenges all impact the planning process of major commands, such as combatant commands.

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Today's senior leaders need to heed the advice of general of the Army Dwight D. Eisenhower: "Plans are worthless, but planning is everything." Eisenhower understood that winning battles required warfighters to engage each other and build a shared vision and knowledge of the battlespace, not blow the dust off of a sheaf of papers and hope that the planners who produced the documents were able to anticipate the risks and the contingencies the leaders would need to execute once the battle began. Today, combatant commands focus on finishing contingency plans as quickly and as painlessly as possible, and the authors' experience has been that the wargaming portion of COA development is often accomplished hurriedly and with little rigor if it is even done at all.

Risks to courses of action are not revealed, and contingency plans are not developed for friction points identified in COA wargaming (assuming the wargaming is done at all). One of the authors' students who graduated and served in a combatant command recommended that the planning process would be much improved by conducting wargaming throughout the planning process, not just in the fourth step where prescribed by *Joint Planning* (see below). Senior leaders need to ensure that, as a minimum, COA wargaming is done and the risks to the selected COA are documented and contingency plans are developed.

CONCLUSION

The utilization of wargaming across the DOD to gain insights to complex problems and issues has grown over the last several years. Wargaming will continue to be a critical asset for the DOD to address many of the future challenges associated with the growing uncertainty of the future. The authors discussed many of the current difficulties senior leaders have with wargaming and believe that today's leaders, both civilian and uniformed, need an executive course on wargaming to educate them on how to supervise the design, development, execution, and analysis of wargames. They need to understand what

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wargames can do for them and when wargames are not an appropriate tool. They also need to understand what the current challenges are to designing and executing useful wargames, and how they can respond to these challenges.

Sponsor education will always be required, and organizations that do wargaming must take on this responsibility to produce successful, relevant wargames for their sponsors. The techniques the authors have discussed above can be used to outline a sponsor education syllabus to develop a sponsor engagement protocol or program for a wargaming organization.

Chapter Eight

Wargaming for Social Science

Brandon Valeriano, PhD; and Benjamin Jensen, PhD

INTRODUCTION

There has been a recent explosion in interest and research on wargames as methods of social science research.¹ Recreating hypothetical domains of practice often devoid of unclassified, reliable data and evidence (i.e., future wars and covert operations), wargames can provide researchers with a method to gather evidence and observations on events that might otherwise be unobservable or difficult to measure. In short, wargames provide for a method to tackle “wicked” problems or examine what otherwise might be unknown. Like historical case reconstructions, they are reenactments, albeit future-oriented, that recreate key moments of interdependent decision making in fluid environments subject to high degrees of uncertainty and friction.²

A *wargame*, as defined by Peter P. Perla is a “model or simulation whose operation does not involve the activities of actual military forces, and whose sequence of events affects and is, in turn, affected by the decision made by players presenting

¹ Erik Lin-Greenberg, Reid B. C. Pauly, and Jacquelyn G. Schneider, “Wargaming for International Relations Research,” *European Journal of International Relations* (2021), <https://doi.org/10.1177/13540661211064090>; Reid B. C. Pauly, “Would US Leaders Push the Button?: Wargames and the Sources of Nuclear Restraint,” *International Security* 43, no. 2 (2018), <https://doi.org/10.1162/ISEC.a.00333>; and Andrew W. Reddie et al., “Next-generation Wargames,” *Science* 362, no. 6421 (2018), <https://doi.org/10.1126/science.aav2135>.

² Richard Buchanan, “Wicked Problems in Design Thinking,” *Design Issues* 8, no. 2 (1992).

opposing sides.”³ Wargames have a long history of use in military communities. The authors’ purpose here is to not review this history but to examine the nature of experimentation and hypothesis testing in gaming settings. From the application of “military chess” in eighteenth century Germany to the modern equivalent advanced by the U.S. military, wargames provide a means to explore outcomes and win conditions in various scenarios. This situates wargames as a theory of practice and theory of decision making that uses reconstructions to understand how actors approach the complex system that is war.

The focus here is mainly on analytic wargames, “distinct in that the purpose of play is not to improve player ability or generate an enjoyable experience, but to help further the understanding of a phenomenon by observers and analysts, and to generate data that can be subsequently analyzed to improve and refine future planning.”⁴ The goal is to gain more from a game than just experience; data can be extracted and analyzed after multiple iterations transforming the purpose and utility of a wargame.

Seen as a social science method, wargames illuminate a pathway toward both novel methods of experimentation and as a means of investigating plausible alternative futures that have yet to occur in the real world. The use of wargames to evaluate interdependent decision making has a long tradition in the military profession and strategic studies communities.⁵ Wargames, as a form of simulation, are a useful method for evaluating competing hypotheses, focusing data investigations, and delineating patterns otherwise unobserved through massive online interactions. They can provide inputs to future-

³ Peter P. Perla, *The Art of Wargaming: A Guide for Professionals and Hobbyists* (Annapolis, MD: Naval Institute Press, 1990), 276.

⁴ Benjamin Jensen and David Banks, *Cyber Operations in Conflict: Lessons from Analytic Wargaming*, CLTC Occasional White Paper Series (Berkeley: Center for Long-Term Cybersecurity, University of California, 2018), 8.

⁵ Perla, *The Art of Wargaming*; and Martin van Creveld, *Wargames: From Gladiators to Gigabytes* (Cambridge, UK: Cambridge University Press, 2013), <https://doi.org/10.1017/CBO9781139579872>.

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oriented counterfactual scenarios that form the core of defense planning. This chapter explores how wargames can leverage social science techniques and how social science research can leverage wargames to investigate novel topics.

Yet, utilizing wargames as a method does not come without controversy and intense pushback from some in the wargaming community who see wargames as an art, not a science. For many, wargames are subjective events that defy replication and generalizability that are core functions of social science.⁶ This chapter will review both the utility and potential drawbacks of wargames for social science, situating the issue as a novel method not without criticism. As with all methods of social science analysis, knowledge of the possibilities and limitations of the research method is critical to understanding how progress can be made on questions that have no obvious answers. War is a core social problem and therefore sometimes requires tried and tested methods of social science investigation to uncover otherwise unknown patterns and connections.

Analytic wargames remain a viable method of exploring contingent outcomes that apply untested technological innovations, a research process that can be enhanced by utilizing social science methods. At the same time, the wargame community can bring much to the social science community by allowing for exploration of novel hypotheses that lack empirical information providing fertile grounds for research. This chapter proceeds with an exploration of what social science research is, how wargames currently employ social science research, and finally, the potential downsides of applying social science to wargaming.

WHAT IS SOCIAL SCIENCE AND WHY DOES IT MATTER?

Defining *social science* can be tricky. The subject matter is so

⁶ Peter P. Perla, "Now Hear This—Improving War-gaming Is Worthwhile—and Smart," U.S. Naval Institute *Proceedings* 142, no. 1 (2016).

broad, and many analysts go directly to explaining the research methodologies, following Emile Durkheim's early entry in 1895, without diving into social science as an epistemology.⁷ The United Kingdom's Economic and Social Research Council defines social science as "the study of society and the manner in which people behave and influence the world around us."⁸ The broader field is made up of many different disciplines including sociology, political science, and economics. The tradition generally invokes quantitative or qualitative research methods that follow the scientific method.

The basic premise for the social sciences is that scholars can seek to build knowledge to understand and explain the functions of society. Alvin Goldman and Cailin O'Connor believe that "epistemology in general is concerned with how people should go about the business of trying to determine what is true, or what are the facts of the matter, on selected topics."⁹ What are the social facts inherent in society and what methods allow scholars to understand what makes up fact and observation?

Centered directly as part of scholarship after the enlightenment, the social sciences seek to explain how the world and society works in order to achieve some form of progress or at least understanding.¹⁰ The social sciences are often seen as an outgrowth of the positivist tradition to determine what might be the core of knowledge, as opposed to the deconstruction in the post-modern project. This connection became so great that during the 1950s, "the term behavioral

⁷ Emile Durkheim, *Les Règles de la méthode sociologique* [The Rules of Sociological Method] (Paris: Alcan, 1895).

⁸ "What Is Social Science?," Economic and Social Research Council, accessed 31 January 2022.

⁹ Alvin Goldman and Cailin O'Connor, "Social Epistemology," in *The Stanford Encyclopedia of Philosophy*, ed. Edward N. Zalta (Stanford, CA: Metaphysics Research Lab, Stanford University, 2021).

¹⁰ Ryan Patrick Hanley, "Social Science and Human Flourishing: The Scottish Enlightenment and Today," *Journal of Scottish Philosophy* 7, no. 1 (2009): 29–46, <https://doi.org/10.3366/E1479665108000316>.

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sciences was often applied to the disciplines designated as the social sciences.”¹¹

The core challenge of social science methods is judgment aggregation, or how we understand that the decisions of individuals feed into the behavior of groups that make up social units.¹² The goal is to understand the wisdom of the crowd, and how groups collectively come up with solutions to problems.¹³ This leads directly to the issue of wargames; applying social science methods to wargames allows researchers to understand the wisdom of the crowd by exploring outcomes among many, not the just the select few, over multiple iterations.

The central idea is the larger the sample, the more likely one is to see a central tendency and convergence to a future mode. The countervailing wisdom is that the interdependent decision making defining high politics and war are not reproducible due to contingency, the small sample of the population that in their life will find themselves “at the table,” and the unique character of those moments (i.e., fog, friction, chance).¹⁴ The analytical question is how best to approximate these moments: single, large-scale wargames with experienced players or through multiple iterations mixing experienced and novice players confronting a choice horizon.

Critically, the social sciences differ from the hard sciences in that methods of observation and experimentation are difficult when they involve social functions and human beings. Holding a treatment sterile is impossible in the social world. Another challenge for the community is that war is a rare event and the

¹¹ R. A. Nisbet and Liah Greenfeld, “Social Science,” *Encyclopedia Britannica*, 22 October 2021.

¹² Christian List and Philip Pettit, *Group Agency: The Possibility, Design, and Status of Corporate Agents* (Oxford, UK: Oxford University Press, 2011), <https://doi.org/10.1093/acprof:oso/9780199591565.001.0001>.

¹³ James Surowiecki, *The Wisdom of Crowds* (New York: Anchor, an imprint of Random House, 2005).

¹⁴ Jonathan Bendor and Jacob N. Shapiro, “Historical Contingencies in the Evolution of States and Their Militaries,” *World Politics* 71, no. 1 (2019): 126–61, <https://doi.org/10.1017/S0043887118000229>.

most unsterile and contaminated environment known to humanity.¹⁵ This makes observation difficult and statistical analysis even more complicated because of the rarity of the event and impossibility of creating control and treatment groups. War and conflict are not events that can be created or induced.

Wargames can then provide a service as a methodological innovation allowing observers to seek to understand how social agents behave during the chaotic and complicated strategic conditions presented during battle. The goal is to explore how the social world works with either qualitative or quantitative methods. As a method of social science, wargames allow for experimentation and simulation of rare events to observe how individuals function in social units during adverse conditions unlikely to be replicated without enormous costs. Extracting data from these interactions is the natural next step and a core function of social science methodologies.

WARGAMES AS SOCIAL SCIENCE

With a rising concern about the impact of emergent technologies (such as cyber, artificial intelligence, and unmanned vehicles) on the battlefield, there is a corresponding renaissance in the use of wargames to evaluate interdependent decision making in a strategic setting. As Benjamin Jensen and David Banks note, “analytic wargames represent a proven approach for assessing the potential outcomes of uncertain future events like cyber war.”¹⁶ Bethany L. Goldblum, Andrew W. Reddie, and Jason C. Reinhardt echo that “empirical data on the impact of emerging technologies such as cyber weaponry, advanced intelligence, surveillance, and reconnaissance tools, and precision-guided munitions are lacking.”¹⁷

¹⁵ Gary King and Langche Zeng, “Explaining Rare Events in International Relations,” *International Organization* 55, no. 3 (2001): 693–715, <https://doi.org/10.1162/00208180152507597>.

¹⁶ Jensen and Banks, “Cyber Operations in Conflict,” 7.

¹⁷ Bethany L. Goldblum, Andrew W. Reddie, and Jason C. Reinhardt, “Wargames as Experiments: The Project on Nuclear Gaming’s SIGNAL Framework,” *Bulletin of the Atomic Scientists*, 29 May 2019.

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Wargames can provide a unique service helping the research community understand the impact of new innovations in disruptive technology when they are lacking empirical observations. Useful examples include military investments in artificial intelligence, evaluating competitive strategies, and state use of cyber operations during a militarized dispute.

The goal is understanding how future applications of technology might impact decision making and doctrine. By repeating play and designing scenarios that apply different treatments, researchers can explore the contingent nature of outcomes. As Benjamin Schechter, Jacquelyn Schneider, and Rachael Shaffer note that “recent work on the integration of experiments within wargaming suggests wargames can utilize social scientific methods, and prioritizing iteration, control, and generalizability within experimental design can provide new opportunities for wargames.”¹⁸

First, the different types of social science research that can incorporate wargames must be explored. Not all social science methods are created alike, and the wargame community has undertaken experimental wargames, computational simulations, and alternative reality/counterfactual thought experiments to understand how novel technologies can impact the battlefield.

Experimental Methods

Experimental methods used for research in political science and international relations scholarship is not new. What is new is connecting wargames with traditional social science methodologies leveraged at scale through computational technologies. Others have explored the nature of experimental research

¹⁸ Benjamin Schechter, Jacquelyn Schneider, and Rachael Shaffer, “Wargaming as a Methodology: The International Crisis Wargame and Experimental Wargaming,” *Simulation and Gaming* 52, no. 4 (2021): 513–26, <https://doi.org/10.1177/1046878120987581>.

design in greater depth.¹⁹ For the purposes of this chapter, the core idea is that experiments hold treatment conditions and randomization at the heart of the research design to explore varying hypotheses.

Peter P. Perla, Michael Markowitz, and Christopher Weuve argue that “games provide a wealth of flexibility for exploring, testing, and demonstrating a host of variables and issues associated with decision making.”²⁰ Thus, the core of the experimental method as applied to wargaming is to allow for flexibility in altering treatments and variables to explore decision making. Through multiple iterations reproduced at enormous scale, researchers can examine the statistical support for the various hypotheses proposed.

Schechter, Schneider, and Shaffer note that experimental applications within wargames are not a new development, with many in the past exploring similar ground.²¹ They argue that some conditions can be relaxed in experimental wargame-

¹⁹ Thad Dunning, *Natural Experiments in the Social Sciences: A Design-based Approach* (Cambridge, UK: Cambridge University Press, 2012), <https://doi.org/10.1017/CBO9781139084444>; Thad Dunning, “Transparency, Replication, and Cumulative Learning: What Experiments Alone Cannot Achieve,” *Annual Review of Political Science* 19 (2016): 541–63; Jens Hainmueller, Daniel J. Hopkins, and Teppei Yamamoto, “Causal Inference in Conjoint Analysis: Understanding Multidimensional Choices via Stated Preference Experiments,” *Political Analysis* 22, no. 1 (2014): 1–30, <https://doi.org/10.1093/pan/mpt024>; Susan D. Hyde, “Experiments in International Relations: Lab, Survey, and Field,” *Annual Review of Political Science* 18 (2015): 403–24, <https://doi.org/10.1146/annurev-polisci-020614-094854>; and Rose McDermott, “Experimental Methods in Political Science,” *Annual Review of Political Science* 5, no. 1 (2002): 31–61, <https://doi.org/10.1146/annurev.polisci.5.091001.170657>.

²⁰ Peter P. Perla, Michael Markowitz, and Christopher Weuve, *Game-Based Experimentation for Research in Command and Control and Shared Situational Awareness* (Alexandria, VA: CNA, 2005), 3.

²¹ Lincoln P. Bloomfield and Barton Whaley, *The Political-military Exercise: A Progress Report* (Cambridge: Center for International Studies, Massachusetts Institute of Technology, 1963); John A. Kringen, “Utility of Political Gaming: An Evaluation,” *Simulation & Games* 11, no. 2 (1980): 139–48, <https://doi.org/10.1177/0037550080112001>; Robert Mandel, “Political Gaming and Foreign Policy Making during Crises,” *World Politics: A Quarterly Journal of International Relations* 29, no. 4 (1977): 610–25, <https://doi.org/10.2307/2010041>; and Schechter, Schneider, and Shaffer, “Wargaming as a Methodology.”

mes in favor of greater external validity if the sample allows building on the idea that experiments within wargames offer a great amount of flexibility to the researcher.²²

The focus of recent wargame scholarship is on emergent technologies and exploring their impact on outcomes utilizing recent advances in the field including online experiment methodologies enabled by services such as Amazon's crowdsourcing platform Mechanical Turk (MTurk).²³ But there are many questions that are yet unanswered; for example, what are the consequences of running online versus in-person wargames and what is the proper process of building out surveys to support wargame experiments?

Computational Simulations

There is a long and ancient history of computer simulations being used to understand global politics, with the movie *War-games* (1983) being a prime example.²⁴ We use the term *computational simulations* to distinguish between role-playing simulations where students are often encouraged to act as specific decision makers to understand different components of international security, particularly diplomacy.²⁵

Computational simulations differ from experiments in two core ways. First, they primarily are computer based to quickly

²² Schechter, Schneider, and Shaffer, "Wargaming as a Methodology."

²³ Nicholas C. Hunt and Andrea M. Scheetz, "Using MTurk to Distribute a Survey or Experiment: Methodological Considerations," *Journal of Information Systems* 33, no. 1 (2019): 43–65, <https://doi.org/10.2308/isys-52021>.

²⁴ *Wargames*, directed by John Badham (Beverly Hills, CA: United Artists, 1983), 1:54 min.; and Harold Steere Guetzkow, *Simulation in International Relations* (Englewood Cliffs, NJ: Prentice-Hall, 1963).

²⁵ Victor Asal and Elizabeth L. Blake, "Creating Simulations for Political Science Education," *Journal of Political Science Education* 2, no. 1 (2006): 1–18, <https://doi.org/10.1080/15512160500484119>; Dave Bridge and Simon Radford, "Teaching Diplomacy by Other Means: Using an Outside-of-class Simulation to Teach International Relations Theory," *International Studies Perspectives* 15, no. 4 (2014), <https://doi.org/10.2139/ssrn.2203120>; and Pamela S. Chasek, "Power Politics, Diplomacy and Role Playing: Simulating the UN Security Council's Response to Terrorism," *International Studies Perspectives* 6, no. 1 (2005): 1–19, <https://doi.org/10.1111/j.1528-3577.2005.00190.x>.

ease replication and recreating abstract conditions of play at scale. Like bootstrapping methodologies, computational simulations often feature random treatments with replacements (alternating independent variables). Simulations seek to explore complex system dynamics with the aid computational power. A useful example is using a simulation to explore systemic politics and the impact of anarchy on world politics.²⁶

Second, simulations often cannot hold the conditions of experiments standard since it might be impossible to randomize treatments or to recreate the same conditions each play because of the massive scale of the simulation and its evolution over time. There is a long history of simulation in international relations research and the recent interest in wargames often excludes these early developments.²⁷ This is done to focus on the new and novel but forgetting the path that was blazed by others.

Computational simulations generally fell out of favor as research methodologies with the advent of massive datasets and the statistical tools used to analyze the data like IBM's SPSS Statistics and Stata. These statistical programs leveled the playing field and ushered in a new era of international relations research in the mid-1990s that sought to examine the behavior of systems and complex units in relation to interstate war, terrorism, and intrastate war. With the coming of new technologies that seek to transform the battlefield in the 2020s, a new utility for simulations emerged bringing the issue full circle.

²⁶ Mary M. McCarthy, "The Role of Games and Simulations to Teach Abstract Concepts of Anarchy, Cooperation, and Conflict in World Politics," *Journal of Political Science Education* 10, no. 4 (2014): 400–13.

²⁷ Stuart A. Bremer, "Computer Modeling in Global and International Relations: The State of the Art," *Social Science Computer Review* 7, no. 4 (1989): 459–78, <https://doi.org/10.1177/089443938900700406>; Stuart A. Bremer, *Simulated Worlds: A Computer Model of National Decision-making* (Princeton, NJ: Princeton University Press, 2015); Robert Mandel, "An Evaluation of the 'Balance of Power' Simulation," *Journal of Conflict Resolution* 31, no. 2 (1987): 333–45, <https://doi.org/10.1177/0022002787031002006>; and Michael D. Ward and Alex Mintz, "Dynamics of Military Spending in Israel: A Computer Simulation," *Journal of Conflict Resolution* 31, no. 1 (1987): 86–105, <https://doi.org/10.1177/0022002787031001006>.

Alternative Reality and Counterfactuals

Most work in political science and history involves counterfactual thought experiments presented as exploring competing hypotheses without the researcher generally knowing that this is the process of investigation. As Paul W. Schroeder notes, historians use and propose counterfactuals to analyze what might come to pass.²⁸ Military scholars do the same to explore alternative realities, researchers thus propose counterfactuals that take the form of alternative novel hypotheses. Introducing condition X might lead to outcome Y, but how does one evaluate the probabilities and realities involved with alternative futures?

John S. Odell notes that a counterfactual argumentation, and thus futures projections, is speculation by definition, making these forms of thought exploration dubious without a tether to an identifiable method.²⁹ Some researchers propose necessary condition case studies as a method to explore counterfactual outcomes.³⁰ Yet, the entire purpose of a wargame can be thought of as a rules-based exploration of a counterfactual condition inherent in most social science.

A wargame is a way to reduce complexity and explore differing catalysts that might impact outcomes. As William R. Thompson notes, exploring catalysts and contingent causation is a tricky proposition that demands a careful examination of what options are plausible and realistic, avoiding the grander projections often offered by fiction.³¹ Wargames offer the researcher a methodology to explore these processes while also

²⁸ Paul W. Schroeder, "Necessary Conditions and World War I as an Unavoidable War," in *Explaining War and Peace: Case Studies and Necessary Condition Counterfactuals*, ed. Jack Levy and Gary Goertz (London: Routledge, 2007).

²⁹ John S. Odell, "Case Study Methods in International Political Economy," *International Studies Perspectives* 2, no. 2 (2001): 161–76, <https://doi.org/10.1111/1528-3577.00047>.

³⁰ Gary Goertz and Jack S. Levy, "Causal Explanation, Necessary Conditions, and Case Studies," in *Explaining War and Peace*, 9–45.

³¹ William R. Thompson, "A Streetcar Named Sarajevo: Catalysts, Multiple Causation Chains, and Rivalry Structures," *International Studies Quarterly* 47, no. 3 (2003): 453–74, <https://doi.org/10.1111/1468-2478.4703008>.

tethering them to the possible in the avoidance of the spectacular.³²

Recent Examples

There are many recent examples using wargames combined with experimental methodologies to explore the impact of emergent technology. Nuclear warfare has been a particularly active question in the research space with Reid B. C. Pauly leveraging a sample of archival wargames with strategic elites to examine attitudes toward nuclear weapons, finding restraint based on reputational and practical risks dominates.³³ What is most interesting about Pauly's article is the use of "records from the golden age of political-military gaming" to understand the behavior of nuclear capable actors during a crisis.³⁴ By focusing on strategic elites from archived games 1958 to 1972, it is possible to review how actors behaved when the context was most appropriate.

The University of California-Berkeley's Project on Nuclear Gaming (PoNG) explores decision making during conflict escalation with controlled experiments, enabling a massive online wargame simulation that explores nuclear war.³⁵ The results from the PoNG game have yet to be published, but the group has certainly raised awareness on the possibility of large-scale, decision-making games and won awards on game design.³⁶ Likely this game design will highlight the utility of computational simulations since the focus on the large systems at play during nuclear warfare.

³² Although this might not always be true, and wargame designers are just as susceptible to the ridiculous as fiction writers. Professional military wargames typically try to avoid exploring implausible conditions such as two- or three-front nuclear wars, but this view is not universal in the community such as in James Lacey, "How Does the Next Great Power Conflict Play Out?: Lessons from a Wargame," *War on the Rocks*, 22 April 2019.

³³ Pauly, "Would U.S. Leaders Push the Button?"

³⁴ Pauly, "Would U.S. Leaders Push the Button?," 157.

³⁵ Goldblum, Reddie, and Reinhardt, "Wargames as Experiments"; and Reddie et al., "Next-generation Wargames."

³⁶ "What Is PoNG?," PoNGBerkeley.edu, accessed 31 January 2022.

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Erik Lin-Greenberg leverages wargame experiments to explore the nature of conflict, proposing that downing an unmanned vehicle instead of a manned vehicle would lead to less conflict escalation. He finds support for the “remote controlled restraint” theory by blending experimental treatments with case study explorations, noting the limitations of survey methodologies in this setting.³⁷ Bartels et al. also demonstrate the novelty of the wargame experiment methodology, exploring the impact of briefing materials on decision making.³⁸ The team found, counterintuitively, that player experience was a bigger factor than the actual briefing materials.

There is a special interest in using games to uncover the dynamics of interdependent decision making in cyber exchanges. Jacquelyn G. Schneider also used a longitudinal analysis of wargames between 2011 and 2016 to study crisis dynamics. Her work revealed that government officials were reluctant to use high-end cyber offensive capabilities.³⁹ Of note, Schneider found that participants only used offensive cyber capabilities after conventional military strikes and they expressed concerns that using offensive cyber would increase the risk of nuclear escalation. Jensen and Banks found similar patterns in a series of wargames analyzing how decision makers integrated cyber operations into crises with both great power competitors and nonstate actors.⁴⁰ Escalation was the exception, not the rule.

Benjamin Jensen, Scott Cuomo, and Chris Whyte’s work builds on this continuum to explore the nature of cyber escalation through wargames and controlled experiments.⁴¹ Jensen

³⁷ Erik Lin-Greenberg, “Wargame of Drones: Remotely Piloted Aircraft and Crisis Escalation,” SSRN (2020), <http://dx.doi.org/10.2139/ssrn.3288988>.

³⁸ Elizabeth Bartels et al., *Do Differing Analyses Change the Decision?: Using a Game to Assess Whether Differing Analytic Approaches Improve Decisionmaking* (Santa Monica, CA: Rand, 2019), <https://doi.org/10.7249/RR2735>.

³⁹ Jacquelyn G. Schneider, “Cyber and Crisis Escalation: Insights from Wargaming” (paper presented at the USASOC Futures Forum, Fayetteville, NC, 21 March 2017).

⁴⁰ Jensen and Banks, “Cyber Operations in Conflict.”

⁴¹ Benjamin Jensen, Scott Cuomo, and Chris Whyte, “Wargaming with Athena: How to Make Militaries Smarter, Faster, and More Efficient with Artificial Intelligence,” *War on the Rocks*, 5 June 2018.

and Valeriano designed the wargame to ensure the right context and players and that it replicated the crisis atmosphere as much as possible during the national security decision-making process. The scenario pitted green state versus purple state, two nuclear-armed rival states with power parity. Using hypothetical states helped filter the participants from preexisting biases about current international relations. The wargame involved 400 international participants, including graduate and undergraduate students, government officials, military officers, and private sector employees.⁴²

The team then expanded the study to a controlled experiment testing hypotheses on cyber escalation among a population of U.S., Israeli, and Russian survey respondents to understand wider social patterns. Using a population mix avoids the external validity questions raised by only using college students and examines the potential uniformity in respondents globally.⁴³ We find some evidence that cyber operations can provide an offramp from conflict, deescalating tensions.⁴⁴ The experiment also revealed vast differences in how various populations responded to the treatment scenarios with the Russians being the most prone to escalation.

To summarize, there are many different methods of social science research that can be leveraged by the wargaming community. Experimental methods are useful to explore multiple hypotheses in a statistically valid manner while also relying on internal validity to ensure consistency across the experimental

⁴² Benjamin Jensen and Brandon Valeriano, *What Do We Know about Cyber Escalation?: Observations from Simulations and Surveys* (Washington, DC: Scowcroft Center for Strategy and Security, Atlantic Council, 2019).

⁴³ Alex Mintz, Steven B. Redd, and Arnold Vedlitz, "Can We Generalize from Student Experiments to the Real World in Political Science, Military Affairs, and International Relations?," *Journal of Conflict Resolution* 50, no. 5 (2006): 757–76, <https://doi.org/10.1177/0022002706291052>.

⁴⁴ Brandon G. Valeriano and Benjamin Jensen, "De-escalation Pathways and Disruptive Technology: Cyber Operations as Off-Ramps to War," in *Cyber Peace: Charting a Path Towards a Sustainable, Stable, and Secure Cyberspace*, ed. Scott Shackelford, Frederick Douzet, and Chris Ankersen (Cambridge, UK: Cambridge University Press, 2021).

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conditions. Computational simulations are useful to explore large systemic structures and engage many players over multiple iterations at scale. Finally, alternative reality or counterfactual simulations can help explore future scenarios if they are plausible explorations of specific catalysts. The recent explosion of interest in social science wargames provides many examples that will become the exemplars moving forward as others join the practice.

MORE METHODS, MORE PROBLEMS

After the challenge introduced by former Deputy Secretary of Defense Robert O. Work to the community, wargames once again became relevant to the core functions of national security.⁴⁵ The main inflection point comes not from those that reject the idea of learning from wargames, but rather differing visions of the purpose of the wargame itself. In some ways, applying social science methodology places the wargame at the center of knowledge construction, whereas for many the purpose of the wargame is to examine the process of decision making itself. This divergence in perspective demonstrates that while social science methods can add to the wargame community, the practice is not to be undertaken without care.

Is someone encouraged to learn from the wargame or learn during the wargame? The goal for some is not to test a hypothesis, but rather to induce the participant to follow the rules of order to get to the proper decision without examining the nature of decision making. This central tension makes up the core of the dispute between the wargaming community and the social science community. We further explore these tensions by examining core criticisms of the social science enterprise as leveraged by wargamers. These criticisms challenge social scientists by noting the difficulty in replication, issues with the player pool, and the concern of peer review and classi-

⁴⁵ Bob Work and Gen Paul Selva, "Revitalizing Wargaming Is Necessary to Be Prepared for Future Wars," *War on the Rocks*, 8 December 2015.

fiction can all pose central restrictions on how social scientists leverage wargames.

Scale and Replication

The first proper challenge to wargames as methods of social science comes due to issues with scale and replication. Logistical difficulties are also said to inhibit the nature of wargame experiments, with cost-inhibiting multiple treatments.⁴⁶ Yet, this challenge has been mitigated through time with the scalability and portability of computation technology. The pandemic (2019–present) has also enabled more interactions at distance and at scale, minimizing the difficulty of reproducing experimental settings with some having even moved to Zoom wargames (games via video conferencing applications). Overall, though, the researcher needs to be aware of the logistical challenges introduced by wargame experiments and be prepared to adjust as needed as challenges and conditions demand.

This leads to a core central challenge to the wargaming community. By making the wargame more than about the experience of any specific game, the community can move beyond the common refrain that wargames are just BOPSAT (bunch of people sitting around talking).⁴⁷ With technological improvements, wargames can serve a higher order purpose than just an experience; we can learn about collective experiences and hold the conditions of the scientific method at the core of research by leveraging social science methods.

Replication becomes possible through a focus on repeating gaming interactions to reach proper statistical samples that will generate statistical significance.⁴⁸ While statistics on signifi-

⁴⁶ Perla, Markowitz, and Weuve, *Game-Based Experimentation for Research in Command and Control and Shared Situational Awareness*.

⁴⁷ Jon Compton, "The Obstacles on the Road to Better Analytical Wargaming," *War on the Rocks*, 9 October 2019.

⁴⁸ Generally, a sample near 1,000 will generate statistical significance. This number can increase or decrease based on the number of treatments or scenarios offered in a wargame. While statistical significance has long been an overwrought statistic, at its most basic sense, it helps the observer understand if the sample is more than random.

cance are of course overwrought in the scientific community, it remains important to gather as wide and diverse a sample as possible to ensure the study is generalizable.⁴⁹

The Player Pool

Jenny Oberholtzer et al. introduce a prime criticism of wargames as experiments. They argue “observations of players who do not resemble actual decision-makers can produce statistically significant results, they are likely to be irrelevant to real-world policy decisions about escalation and nuclear use.”⁵⁰ The clear conjecture is that by selecting the right sample in a seminar style game without repeated play, researchers can better understand decision making at the elite level.

The dependence on Western student populations (or WEIRD in the literature for Western, educated, industrialized, rich, and democratic) for traditional surveys is problematic, especially in a military context.⁵¹ Yet, it is not clear that elite decision making is at all better or different from the general public at large.⁵² In fact, elite decision makers introduce their own forms of bias into the analysis, and it is the compositional dynamics (income, education, and race) that distinguish the groups.⁵³

The challenges of including elite respondents are extensive. Elite respondents often are overconfident and fall into confirmation bias tropes, making their judgment overall just

⁴⁹ Blakeley B. McShane et al., “Abandon Statistical Significance,” *American Statistician* 73, sup. no. 1 (2019): 235–45, <https://doi.org/10.1080/00031305.2018.1527253>.

⁵⁰ Jenny Oberholtzer et al., “Applying Wargames to Real-world Policies,” *Science* 363, no. 6434 (2019): 1406, <https://doi.org/10.1126/science.aaw6278>.

⁵¹ Dan Jones, “A WEIRD View of Human Nature Skews Psychologists’ Studies,” *Science* 328, no. 5986 (2010): 1627, <https://doi.org/10.1126/science.328.5986.1627>; and Mintz, Redd, and Vedlitz, “Can We Generalize from Student Experiments to the Real World in Political Science, Military Affairs, and International Relations?”

⁵² Joshua D. Kertzer, “Re-assessing Elite Public Gaps in Political Behavior,” *American Journal of Political Science* (2020), <https://doi.org/10.1111/ajps.12583>.

⁵³ Kertzer, “Re-assessing Elite Public Gaps in Political Behavior”; and Lior Sheffer et al., “Nonrepresentative Representatives: An Experimental Study of the Decision Making of Elected Politicians,” *American Political Science Review* 112, no. 2 (2018): 302–21, <https://doi.org/10.1017/S0003055417000569>.

as suspect as the student.⁵⁴ Elite and nonelite populations also can raise internal validity concerns by playing the game the way an observer or supervisor might want them to play it rather than behaving as an independent actor. As Reid B. C. Pauly notes, the player might behave as they think they ought to rather than how “what I would do.”⁵⁵

As Bethany Goldblum, Andrew Reddie, and Jason Reinhardt note, “particular subject pools may introduce bias, based on their age, gender, education level, income, or other socio-demographic characteristics. . . . Game design and rule set may influence the experimental outcomes.”⁵⁶ There are potential forms of bias introduced at all levels, so it is the job of the scholar to control for these issues by extracting relevant data from the respondents to study the impact of gender, experience, and other demographics, exploring these factors influence on outcomes. This should be done for all studies, regardless of sample size, yet the larger sample sizes demanded by experimental designs generally are able to control these issues better than seminar style games.

Overall, it would be useful to remember Perla’s warning that “real wargaming is about the conflict of human wills confronting each other in a dynamic decision making and story-living environment. There is a place for technology in supporting the clash of wills, but electrons are not always the most useful technology to apply.”⁵⁷ Despite the various goals of study for different wargame designs, the importance of designing a solid game for human players will always trump other concerns.

Peer Review and Classification

As Ivanka Barzashka notes, another core challenge is the peer

⁵⁴ Philip E. Tetlock, *Expert Political Judgment: How Good Is It? How Can We Know?* (Princeton, NJ: Princeton University Press, 2009).

⁵⁵ Pauly, “Would US Leaders Push the Button?,” 160.

⁵⁶ Goldblum, Reddie, and Reinhardt, “Wargames as Experiments.”

⁵⁷ Peter P. Perla, “Now Hear This—Improving Wargaming Is Worthwhile—and Smart,” U.S. Naval Institute *Proceedings* 142, no. 1 (January 2016).

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review of wargames.⁵⁸ The specific tendency for overclassification of wargame products in the U.S. system leads to problems of evaluation and replication. Scholars and researchers cannot know what has been done in the past or even during current wargame efforts if they are placed behind the wall of top secret classification. The solution is to ensure that peer review is still conducted by the appropriate researchers with the ability to evaluate classified products.

The challenge is that there are more fundamental questions that need to be asked about the requirement of classified games. Is the goal to educate and evaluate or is the goal to innovate? If the goal is to deter and affect the decision-making calculus of the adversary, the advice is to make the wargame part of the strategic communications plan rather than classified.⁵⁹ While decisions on innovation and specific adjustments that need to be made to meet future threats might require classified evaluations, the goal of education and understanding should seek to avoid using classified wargames since it becomes impossible to truly disseminate the findings to the wider research community.

Pauly's work with archival wargames introduces a viable method of exploring decision making based on past action and contexts, though new challenges are introduced by the practice.⁶⁰ The question might be what games exactly were declassified? Is there a comprehensive sample or are the games examined a selection of available cases? Not insurmountable problems, but the research and audience need to be aware of the limitations.

⁵⁸ Ivanka Barzashka, "Wargaming: How to Turn Vogue into Science," *Bulletin of the Atomic Scientists*, 15 March 2019.

⁵⁹ Jeffrey Appleget, Jeffrey Kline, and James J. Wirtz, "Do Wargames Impact Deterrence?," in *Military Exercises: Political Messaging and Strategic Impact*, ed. Beatrice Heuser, Tor-mod Heier, and Guillaume Lasconjarias Forum Paper 26 (Rome, Italy: NATO Defense College, 2018), 27–44.

⁶⁰ Pauly, "Would US Leaders Push the Button?"

Finding Common Ground

When one examines the field of emergent technology, it becomes clear rather quickly that many researchers are just pushing forward conjecture without evidence. This leads to a fairly prominent study of cyber security suggesting escalation will take the form of a wormhole, a finding developed not through evidence but fiction.⁶¹ The recent focus on “useful fiction,” or the more popular concept of FICINT (fiction intelligence), betrays the field of emergent technology’s general inability to examine the impact of technology without reaching toward absurd analogy.⁶²

There is a clear need for wargames leveraged as experiments and simulations to move beyond analogy and fiction. While a wargame might be based on fiction, it explores the behavior of individuals acting as social units if a researcher leverages social science methodologies.⁶³ The impact of technology will reshape our views on war and conflict, but understanding just what changes is the core task of the research program. Guessing cannot be an option when the questions are so critical for national security.

The other core purpose is to explore the nature of assessments and victory conditions during the course of games.⁶⁴ One reason that conflict in the post-11 September 2001 (9/11) world remains so intractable is because planners shape victory conditions during the event, not before. A clear examination of what victory means in the future and how it can be achieved can come through proper experimentation and

⁶¹ Rebecca Hersman, “Wormhole Escalation in the New Nuclear Age,” *Texas National Security Review* 3 (Summer 2020), <http://dx.doi.org/10.26153/tsw/10220>.

⁶² August Cole and P. W. Singer, “Thinking the Unthinkable with Useful Fiction,” *Journal of Future Conflict*, no. 2 (Fall 2020).

⁶³ J. Furman Daniel III and Paul Musgrave, “Synthetic Experiences: How Popular Culture Matters for Images of International Relations,” *International Studies Quarterly* 61, no. 3 (2017): 503–16, <https://doi.org/10.1093/isq/sqx053>.

⁶⁴ Scott Sigmund Gartner, *Strategic Assessment in War* (New Haven, CT: Yale University Press, 1997).

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hypothesis evaluation that is enabled through social science methodologies.

Anyone suggesting that one method has more value than another is missing the point of the current revolution in wargames. It is not that the old methods and play styles need to be discarded, but rather that scholars are now aware of the possibilities and opportunities that wargames provide. Emergent turf battles have no place in the proper conduct of research. Methods utilized vary according to the research problem, goals, and abilities of the researcher running the wargame.

PATH FORWARD

The traditional wargame community might see a threat from the social science community. The idea that wargames are an art and not a science is pervasive, but this simple dichotomy has no place in research. Wargames can be both an art and a science just as many variations of artistic expression are based on science and math. It is up to the researcher or planner running a wargame to determine the purpose of the game, not the community at large.

Thomas J. Culora notes that for many, the wargame is seen as a “regency game” whose objective is to educate and influence senior decision makers.⁶⁵ This imperious view of the role of wargaming betrays the central problem of the perspective. There is no interrogation if this ascendancy of wargaming is warranted. What evidence is there that a wargame should be used to influence rather than communicate or explore?

The core utility of a wargame might not be to educate, but rather to investigate the nature of strategy and its applications leveraging near future technologies. Moving beyond fiction and toward explorations of the possible through counterfactual scenarios and experimental settings is a useful way to ex-

⁶⁵ Thomas J. Culora, “A Wargaming Renaissance,” U.S. Naval Institute *Proceedings* 142 (2016).

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amine the process of innovation and how humans will react to new scenarios that are difficult to recreate.

The utility of wargames is clear; they allow for investigators to explore the dynamics of emergent technology and counterfactual thought conditions in a rigorous way. If the goal is understanding and exploration, wargames provide a novel method to explore human decision making. Games might be much less useful in communicating ideas and teaching patterns to the players without a clear nod toward a strategic communication strategy. Likely more of a science than an art, the rise of wargaming research pushes the community to become clearer about the intended effects they wish to witness, and the conditions under which these outcomes might be seen as patterns rather than induced outliers.

Just as we will not experience nuclear war anytime soon, hopefully, we also seem to be a long way off from the cyberwar that many portended.⁶⁶ Wargames that seek to explore various hypotheses will continue to rise as a prime method of social science investigation engaging emergent technology. The tide is rising, the remaining question is how to ensure that community standards are communicated without creating improper divisions between wargamers and social scientists.

⁶⁶ Richard A. Clarke and Robert K. Knake, *Cyber War: The Next Threat to National Security and What to Do about It* (New York: Ecco, 2012).

Chapter Nine

Whole-of-Government Collaboration

Educational Nuclear Wargaming and Policy Makers

Brooke Taylor, DSL

INTRODUCTION

Nuclear war is such an emotional subject that many people see the weapons themselves as the common enemy of humanity.

~ Herman Kahn¹

Educational wargaming is not a novel construct to the Department of Defense (DOD). To include members of the United States Congress as participants in educational wargaming is a progressive concept that must rapidly catch speed, or it could be game over when ideas meet reality. When such a construct is met with hesitancy for policymakers to attend educational wargames, it demonstrates an example of status quo bureaucratic conventionalism that, in the pursuit of working toward national security solutions, abides in the comfort of fragmentation and results in an overall atrophying solution set that is important to both the legislative and executive branches of government. Within the halls of military installations or school-

¹ Herman Kahn was the founder of the Hudson Institute, a military strategist and futurist. Quote adapted from *Thinking about the Unthinkable in the 1980s* (New York: Simon and Schuster, 1984).

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houses, the rooms of which have never seen sunlight due to security requirements, are the brightest minds in the country tasked with solving increasingly complicated war-preventive and war-responsive problem sets. Gaming counters, thumb-tacks, boards, and maps are surrounded by personnel who maneuver the game, mobile on their rolling chair as they work around the table, some engaged, and others distracted by the mounting to-do list piling up in the office as a function of their involvement in the game. The stage is set, the rules are defined, the players are identified, and the challenge accepted for this handful of participants to begin their work through the game play.

Expand the perspective and then begin to take a roll call of the participants around the table: *What is their professional affiliation? What is their duty title? What is the experience brought to the table allowing them to speak to this particular solution set for national strategy and international security?* Begin to identify and evaluate: *Is there diversity of perspective represented or is there insular, department-derived attendance from the participants?* Then, critically evaluate that if the purpose of such an educational wargame is to prepare for implementation (moving toward or moving away) from the outcome and ponder if the challenge can be met under such tight restrictions of the participants selected to play.

More specifically, educational nuclear wargames, tabletop exercises, and simulations are opportunities for Congress to collaborate with the U.S. Department of Defense.² When the risk of failure is existential, the opportunity of diverse participation across the framework of the whole of government warrants representation from across the government, to include policymakers. Presently, such experiences provide a small number of DOD civilians with a clear understanding of both the value of strategic deterrence and the existential threat that proliferation poses among nation-states and nonstate actors.

² Mike Gallagher, "Bringing Congress to the (Wargaming) Table for a Bigger and Better Navy," *War on the Rocks*, 19 October 2020.

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National security, however, is a shared interest uniquely delegated between the branches of government according to specific roles and responsibilities mandated by law.³ This chapter accomplishes two main goals: first, it articulates the value of including Congress in educational nuclear wargames, tabletop exercises, and simulations by describing—and thereby highlighting—legislative boundaries that must remain intact when DOD leaders and members of Congress are seated at the educational nuclear wargaming table; and second, it provides practical examples of how the first step allows for achieving a whole-of-government approach to collaboration between the executive and legislative branches by altering the prevailing mindset, which is discovered within strategic thinking.⁴

EDUCATIONAL NUCLEAR WARGAMING

The terms *wargame*, *simulation*, and *tabletop exercise* are not synonyms for and also differ from training exercises. The use of simulations virtually immerses an individual into intense maneuvers to prepare for wartime operations. Simulations are helpful for training. Within the creation and context of the game is when ideas of active duty servicemembers, civilian personnel, or military educators actively participating in war strategy, maneuvers, and planning is experienced. For example, Global Thunder is a “nine-day command and control exercise [that] focuses on realistic training scenarios for nuclear readiness of United States forces around the world, allied nations and partner organizations” conducted by more than 150,000 U.S. Strategic Command personnel annually.⁵ This type of military training exercise *does not* necessitate congressional participa-

³ “Intro.7.2.2. The Constitution’s Basic Principles: Separation of Powers,” Constitution Annotated: Analysis and Interpretation of the U.S. Constitution, accessed 2 May 2021.

⁴ This chapter does not advocate congressional participation within Title 10, U.S.C. Armed Forces, Committee on Armed Services, 112th Cong., 1st Sess. (July 2011), wargaming, training, or exercises as an extension of DOD activities and combatant command requirements.

⁵ Ed Adamczyk, “U.S. Strategic Command Completes Global Joint Operations, Readiness Exercise,” United Press International, 28 October 2020.

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tion and illustrates the separation of powers and scope of legality within constitutionally sound cross-branch participation between the executive branches.⁶

In addition, during the height of the Cold War, President Ronald W. Reagan participated in 1983's *Proud Prophet* wargame, which was referred to as the "most realistic exercise involving nuclear weapons ever played by the U.S. government."⁷

Played in real time at the secret facility of the National War College, the simulation went around the clock lasting for two weeks and had hundreds of military officers participating in Washington as well as communicating over top-secret links with all the major U.S. military commands around the world. The game simulated conflict in a myriad of regions, from East Asia to Europe and in the Mediterranean and the Middle East. Also, security had to be protected, so the fact that the secretary and the chairman were playing in the game was concealed from all the players except a tiny handful with the need to know.⁸

In reflection, 1983 was described as a more dangerous period than anyone realized and events after the wargame demonstrated this. What the participants did not realize at the time is how "obsessed" Soviet leaders were becoming, a fact clearly demonstrated after the civilian airliner, Korean Air 007, was shot down by the Soviets in September of that year as they were

⁶ Should a member of Congress be interested in Title 10 wargames, such as Exercise Global Thunder, then the member and/or their personal staff (with appropriate security clearance classifications) or professional staff can reach out to the legislative affairs office to schedule a readout of the game or event that can be provided in a sensitive compartmentalized information facility (SCIF). In fact, it is recommended and encouraged that members and staff maintain an active awareness of the outcomes of such wargames. This is another strategic approach to shape national security policy and ensure proper oversight.

⁷ *Proud Prophet* was designed by Thomas C. Schelling, who was a professor at Harvard University at the time. Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Times Books, an imprint of Henry Holt, 2012), 85.

⁸ Bracken, *The Second Nuclear Age*, 85–86.

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“virtually expecting an American attack.”⁹ Erring on the side of caution regarding congressional overreach and wargaming the “Second Nuclear Age” is increasingly prudent as such actions could very well be interpreted as planning for war and preempt an unintended adversarial response.

Additionally, wargaming is also used among the Department of Defense and supporting agencies for educational purposes. In this context, wargames are “analytical games that simulate aspects of warfare at the tactical, operational, or strategic level. They are used to examine warfighting concepts, train and educate commanders and analysts, explore scenarios, and assess how force planning and posture choices affect campaign outcomes.”¹⁰ These types of wargames are executed in a tabletop fashion where players gather to maneuver, strategize, and work through a series of challenges to a problem set. Wargaming, in this context, can also occur in simulated environments that virtually demonstrate capabilities using augmented and virtual realities.

Educational wargaming, tabletop exercises, or simulations provide the most benefit for Congress to engage with the department as part of the educational process. In this context, the Department of Defense commonly uses an evaluative instrument based on four key variables in its scenario assessments: diplomacy, information, military, and economic (DIME).¹¹ Often, to avoid a predisposition or assumption of conditions that measure courses of action along the DIME without inclusion of policymakers, military participants and researchers will consult members to script out policymaker actions. In such instances, the DOD benefits from understanding the role of legislators, while legislators miss valuable insights into experiencing the decision-making apparatus of the Department of Defense, which vis-à-vis the firsthand knowledge transfer of such educa-

⁹ Bracken, *The Second Nuclear Age*, 86.

¹⁰ “Wargaming,” Rand, accessed 4 May 2021.

¹¹ Donald Bishop, “DIME, Not DIME: Time to Align the Instruments of U.S. Informational Power,” *Strategy Bridge*, 20 June 2018.

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tional wargaming may shift or pivot policymakers predisposed ideas that are “scripted” into the game. This undermines the very premise the wargame or tabletop exercise is meant to convey to participants. Including and giving policymakers a seat at the wargaming table provides valuable perspective to enhance the overall learning experience and derived outcomes.

CROSS-BRANCH COLLABORATION

I will offer a choice, not an echo.

~ Senator Barry Goldwater (R-AZ)¹²

Enacted as law during the Cold War, the Goldwater-Nichols Department of Defense Reorganization Act of 1986 was established by the United States Congress:

To reorganize the Department of Defense and strengthen civilian authority in the Department of Defense, to improve the military advice provided to the President, the National Security Council, and the Secretary of Defense, to place clear responsibility on the commanders of the unified and specified combatant commands for the accomplishment of missions assigned to those commands and ensure that the authority of those commanders is fully commensurate with that responsibility, to increase attention to the formulation of strategy and to contingency planning, to provide for more efficient use of defense resources, to improve joint officer management policies, otherwise to enhance the effectiveness of military operations and improve the management and administration of the Department of Defense, and for other purposes.¹³

As a result of the Goldwater-Nichols Act, the high-level

¹² Goldwater for President Committee Brochure, 3 January 1964.

¹³ Goldwater-Nichols Department of Defense Reorganization Act of 1986, Pub. L. No. 99-433 (1986), 992.

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participation between the Joint Chiefs of Staff, combatant commanders, combatant commands, and the National Security Council provides access to and ongoing collaboration with the executive branch of government and is also designated to maximize the president's access to the Department of Defense.

In the post-Cold War Era and 35+ years since Goldwater-Nichols, the United States now finds itself in an era of strategic competition against two nuclear peer competitors—Russia and China.¹⁴ Cycles of failed procurement, slow acquisition processes, and a defense department that now emphasizes all-domain operations and cross-Service collaboration beg the question of where and how Congress can be most effective in twenty-first century nuclear security legislation.¹⁵ Beyond the arguments of massive bureaucratic restructuring—many of which may not necessitate review, educational wargames, tabletop exercises, and simulations—are immediate and practical ways for legislators to be part of a cross-branch collaboration.

STRATEGIC THINKING AND EDUCATIONAL NUCLEAR WARGAMES

The conditions to include Congress as participants, whether players or observers, around the nuclear wargaming table can be met with resistance or bias those contributing to the game. The siloed strategies that prevailed during the Cold War and lessons learned do not transfer in a one-to-one parity in the modern nuclear age. The annual defense spending that is

¹⁴ Christopher A. Ford, *Competitive Strategy vis-à-vis China and Russia: A View from the "T Suite,"* Arms Control and International Security Papers, vol. 1, no. 6 (Washington, DC: Department of State, 2020), 2.

¹⁵ Kathleen J. McInnis, *The 2018 National Defense Strategy*, CRS Insight (Washington, DC: Congressional Research Service, 2018), 6–10. Note that a primary focus of the Goldwater-Nichols Department of Defense Reorganization Act of 1986 was to increase jointness and overcome inoperability among the Services. A review of Goldwater-Nichols, which is in ongoing discussions among Congress, should be considered in view of such legislative limitations. Congressional participation in wargames, tabletop exercises, and simulations is another practical example for members to see these concerns and issues up close in review of best practices and strategy if/when restructuring Goldwater-Nichols.

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funded by appropriations and the National Defense Authorization Act ebbs and flows according to national priorities.¹⁶ The strategic advantage for Department of Defense leaders and policymakers to collaborate and engage, to better understand adversarial threats and assurance to allies, is in part a guiding framework for deterrence toward these great powers.

For legislators, the focus and need for inclusion in wargaming and simulations is prescriptive. Congress, and specifically the House of Representatives, holds the power of the purse. Federal spending (both mandatory and discretionary) is designated, or prescribed, annually according to national interests and priorities. In August 2020, Michèle Flournoy, who was then viewed as a top contender for secretary of defense in a potential Joseph R. Biden administration, was asked about securing and prioritizing command and control in contested domains:

Sometimes when the department is trying to make those trade-offs to move money from one program to another, if they don't do a good job explaining that to Congress they sort of get the hand from Congress. We really have to make Congress much more of a strategic partner in this exercise. They need to understand why, we know what we're facing, the urgency. They need to be invited into the wargames and to the simulations and to the experimentation and understand why these trade-offs are being made . . . to try to get better buy-in and frankly leadership from some of the key champions on the Hill.¹⁷

For the Department of Defense to provide Congress with a seat at the wargaming table creates a pathway that focuses not on *what* Congress should be thinking about national security, but instead hones into *how* Congress should be thinking about

¹⁶ See, for example, National Defense Authorization Act for Fiscal Year 2022, 117th Cong. (2021–22).

¹⁷ Aaron Mehta, "Flournoy: Next Defense Secretary Needs 'Big Bets' to Boost 'Eroding' Deterrence," *Defense News*, 10 August 2020.

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national security. Educational wargaming and tabletop exercises extend the direct value of strategic thinking within the role of Congress in nuclear security decision making. For the practical value of such strategic partnering to transfer, the first step is understanding the importance of such participation for the DOD to include Congress and, frankly, for Congress to have time to devote its attention to such a cause.

Most policymakers do not view national security as a top priority because of the misnomer, albeit a popular viewpoint, highlighted by David Trachtenberg that “there is not a constituency for national security.”¹⁸ For the politician whose survival hinges on a majority vote, national security decreases in popularity as a talking point. Combined with a nuclear frame, this topic becomes even more highly underrated among the populace at-large unless used as a media scare tactic, and thus manifests itself as being underrated on Capitol Hill. In short, when national security topics combine within a nuclear frame, the job at hand becomes even harder to accomplish.

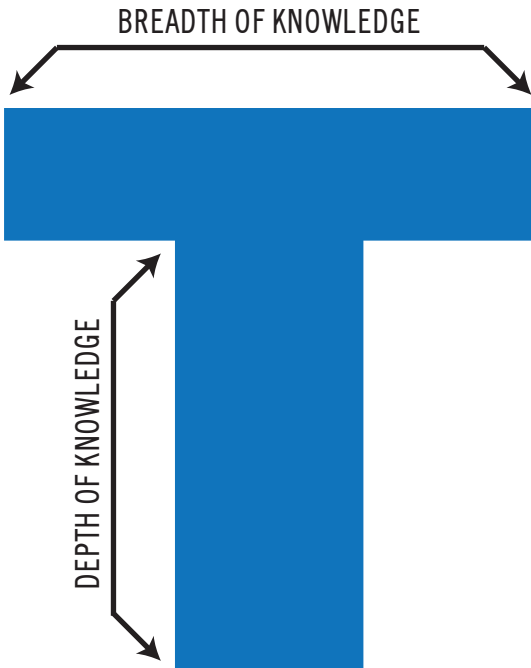
The overarching conclusion is that members of Congress and Department of Defense officials share perspectives, amidst each branch of government’s unique roles, on nuclear security, but exposes missed opportunities to unpack relevant solutions. Across the congressional aisles and the branches of government, solutions often result from solving unproductive and arguably outdated questions. This is where nuclear educational wargaming or tabletop exercises may enhance strategic thinking and present value.

Academics often focus on two schools of strategic thought: divergent and convergent thinking. Divergent thinking looks at the big picture and generates ideas, while convergent thinking examines and arranges those ideas rationally.¹⁹ In fact, some experts believe that the best strategic thinkers are

¹⁸ David J. Trachtenberg, *The Lawgivers’ Struggle: How Congress Wields Power in National Security Decision Making* (Fairfax, VA: National Institute Press, 2020).

¹⁹ Phil Charron, “Divergent and Convergent Thinking in Creative Environments,” *Think* (blog), Think Company, 26 October 2011.

Figure 19. Strategic thinking T



Source: Brooke Taylor, "Nuclear Planning in an Uncertain World," *Space and Defense* 12, no. 2 (Summer 2021): 58–66, adapted by MCUP.

T-shaped. The bar on the top of the T represents the breadth of their knowledge, while the stem represents a deep understanding of their own area of expertise (figure 19).²⁰

Knowingly or not, this paradigm of thinking permeates our government, yet is inverted between both branches. Within the executive branch, the Department of Defense is equipped to bring a deep, singular level of expertise to national security that

²⁰ "What Is Strategic Thinking?," Center for Management and Organization Effectiveness, accessed 10 November 2021.

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is tactical and operational within the warfighting domain and spectrum of conflict. In this analogy of strategic thinking, the DOD is the stem of the T.

By comparison, the legislative branch and policymakers grapple with social, economic, partisan, ideological, and demographic considerations with knowledge that demands knowing something about everything. In some cases, this mile-wide level of expertise may only be an inch deep because of the nature of a policymaker's job. For legislators, more specific areas and depth of expertise come into play through committee and subcommittee assignments that intersect along their breadth of knowledge.²¹

The ultimate outcome of strategic thinking is execution and implementation. This is the point of intersection between the stem and the bar of the strategic thinking T. Consider the T as a representation of knowledge and information among both depth and breadth of the bar and stem. Then visualize the minute point of intersection that must be perfectly centered and anchored to connect big ideas with practical logic. If the breadth of knowledge exceeds the depth, the T loses balance. Depth of knowledge along the stem is what centers the entire formation. However, shift the stem to the left or the right and the stem's focus becomes about partisanship and dooms the entire formation to lose shape and/or balance. The center focus of the Department of Defense should not pivot to partisanship, but rather embrace the shared educational value to experience firsthand policymakers' decision-making processes. That being recognized, Congress must connect to the depth of expertise, in addition to hearings, to understand present nuclear security challenges. This is where tabletop exercises, wargames, and simulations provide practical value for Congress.

²¹ Congress members themselves do not have to be experts, but rather they cultivate and retain wargaming knowledge within their staffs, such as their defense aides. The Congress members would then stand as the horizontal portion of T and the staff provide the vertical section of the T.

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The firsthand impact that is transferred to a member who participates in an educational nuclear wargame, tabletop exercise, or simulation magnifies the national security dilemma and challenge under review. This is a prime example of connecting the depth (tactical and operational duties of the DOD) to the breadth of knowledge and congressional oversight obligations of the legislative branch.

There are also issues that collaboration around the wargaming table can remedy so Department of Defense officials and members of Congress do not speak past each other as they champion for the same cause, making it an ineffective means to understand each other's language or concerns.²² Interpreting this information does fall on staff but at the same time, military leaders at the highest chain of command meeting with members of the most powerful committees could gain so much from each other by spending a few hours engaged and immersed in an educational table-top exercise or wargame.²³

Scenarios are one of several ways to connect the points of focus (depth and breadth of knowledge) for policymakers and uniformed leaders. First credited with using the word scenario, and ultimately, changing the nature of military planning and tabletop exercises altogether, the questions Herman Kahn posited for nuclear security remain in effect within the professional military education system and are questions members of Congress still wrestle with in terms of policy and funding nuclear modernization:

- How likely is accidental war? How can one make it less likely?
- How dangerous is the arms race today?
- What will it be like in the future? What would condi-

²² Sebastian Bae and Paul Kearney, "Use Wargaming to Sharpen the Tactical Edge," *Rand* (blog), 8 March 2021.

²³ Congressional and staff delegations are ways to invite members into existing wargames or activities. See, for example, Ed Mcgrady, "Getting the Story Right about Wargaming," *War on the Rocks*, 8 November 2019.

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tions be if a nuclear attack leveled 50 of America's largest cities? Would the survivors envy the dead?

- How many millions of American lives would an American president risk by standing firm in differing types of crises? By starting a nuclear war? By continuing a nuclear war with the hope of avoiding surrender? How many European, Russian, and other lives would they risk?²⁴

The value of strategic thinking within the role of Congress in nuclear security decision making and the points of intersection between the depth of the challenges the Department of Defense is addressing presently, and the breadth of consideration Congress must understand, begs the questions necessary for the DOD and Congress to work together to resolve and could include:

- With such an emphasis on all-domain operations, where does nuclear command and control fit into this integration?
- What if China does not enter into any arms control agreement and Russia decides to follow suit post-New Strategic Arms Reduction Treaty (START) circa 2026 based on a "they don't have to, so why do I" philosophy?²⁵ Is the United States prepared for this shifting norm?

RECOMMENDATION AND CONCLUSION

We have to prepare for the worst, and the worst is war.

~ Bernard Kouchner²⁶

In order for Congress to participate in educational nuclear war-

²⁴ Kahn, *Thinking about the Unthinkable in the 1980s*.

²⁵ "New START Treaty," Department of State, updated 3 February 2022.

²⁶ French minister of foreign and European affairs (2007–10) and cofounder of Doctors without Borders.

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games and for the benefits of crosstalk and cross-collaboration to occur with the Department of Defense, there must be considerations that create the space for implementation. Rather than rely on the taxing scheduling and limited time availability of Congress to participate in preexisting professional military education nuclear wargames, the DOD should attempt a unique approach. By working with think tanks and academia, the Department of Defense could create an educational nuclear wargame as part of freshman members congressional orientation. Federally Funded Research and Development Centers and University Affiliated Research Centers, such as the United States Strategic Command and the Nebraska Strategic Research Institute, provide a viable means of such educational nuclear wargames.²⁷

Adult learners retain 90 percent of auditory, visual, and kinesthetic information, so this early form of experiential learning imprints a foundational pathway as members find their way to committee assignments throughout their tenure and reelection of service.²⁸ The Congressional Management Foundation is tasked with coordination and access for members and staff to be prepared for the challenges and demands of the call to service.²⁹ By including a national security emphasis or focus on existential risks, members' purview would be expanded to better see, hear, and work through strategies to nuclear policy.

After entering service in the U.S. Congress, these leaders, elected from across the country to represent national interests from all walks of life, are endowed with oversight responsibility. The Department of Defense can hope new members grapple with and come to their same conclusions in identifying spending priorities and fulfilling defense requests. Hope is not a strat-

²⁷ "35.017. Federally Funded Research and Development Centers," Acquisition.gov, 30 January 2022.

²⁸ Jennifer Weichel, "What's Their Learning Style?: Part 1. Auditory Learners," Michigan State University Extension, 15 August 2016.

²⁹ "Congressional Crisis Preparation & Response Center: Managing during the COVID-19 Crisis and Beyond," Congressional Management Foundation, accessed 13 June 2021.

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egy in which the nuclear enterprise should be placed. Rather, it is time for Congress to be brought to the educational nuclear table to further strategic collaboration and strategic conversation discovered through active participation in nuclear wargaming, simulations, and tabletop exercises.

Conclusion

The Die Is Cast

How does one become a wargamer whether as a player, sponsor, analyst, or designer?

This volume strives to shift the discourse in wargaming away from perpetual questions about the utility and nature of wargames to new examinations of the professionalization and evolution of wargaming as a field. Each of the authors approaches this question from a unique perspective, whether as a researcher, military officer, analyst, or educator.

In chapter 1, Wojtowicz explored the core competencies and professionalization of the wargaming field, while highlighting the systemic gaps in the wargaming talent pipeline. This chapter is unique in seeking to codify the necessary skills and aptitudes for wargamers from novice to expert, and the various roles involved in the wargaming process. This bold approach to quantify the wargamer into its atomic components is the reason it opens this edited volume. However, this chapter will undoubtedly inspire intense debate amid the wargaming community, ranging from disagreements about the specified roles and associated competencies to a general aversion to standardization in a field that historically viewed itself as an art. Nevertheless, if we are to forge better wargamers, we must strive to answer the elusive question: What makes a good wargamer?

In chapter 2, Hunter argues wargaming in precommissioning education can lay the groundwork for “intellectual overmatch” by developing mental agility and interdisciplinary thinking early in an officer’s career. Fundamentally, the argu-

ment is persuasive as wargames, and games more broadly, have consistently demonstrated their educational value in both PME and civilian education. This is reflected in the growing use of wargames at other precommissioning institutions such as NROTC and other Service academies. For instance, in 2020, the U.S. Naval Academy established its own Naval History Wargaming Lab and student-run wargaming club, called the Combat Action Lab.¹ Likewise, the U.S. Military Academy also boasts a wargaming club.² Nevertheless, a stark difference exists between demonstrating the value of wargaming and systemically institutionalizing its use. Like all educational wargaming, the overarching challenges of sustained funding, faculty buy-in, resident wargaming expertise, and the ever-present constraint of resistant curricula will be consistent and considerable barriers.³

In chapter 3, Smith outlines the pedagogical approach of the Office of Naval Intelligence's (ONI) SimBAT program, where junior analysts leverage wargames to explore a variety of military issues. The SimBAT program strives to provide professional development to intelligence analysts through the social and experiential model of learning offered in wargames. Similarly, in "Wargaming: A Tool for Naval Intelligence Analysis," Sundstrom, another analyst at ONI, argues intelligence analysts should embrace wargaming as a critical tool.⁴ Yet, as mentioned above with precommissioning programs, educational wargames consistently face several challenges in implementation and continuation, as reflected with the discontinuation of SimBAT in 2011 and its truncated form in 2014. Moreover, like tactical units, the intelligence community suffers from the tyranny of the now, with professional development often sacrificed in the dizzying

¹ "USNA Museum, History Department Establish Naval History Wargaming Laboratory," USNA News Center, 5 August 2020.

² "Wargames Committee," U.S. Military Academy, accessed 18 April 2022.

³ Eric Walters, "Wargaming in Professional Military Education: Challenges and Solutions," *Journal of Advanced Military Studies* 12, no. 2 (2021): 81-114, <https://doi.org/10.21140/mcu.j.20211202003>.

⁴ Ian Sundstrom, "Wargaming: A Tool for Naval Intelligence Analysis," *CIMSEC*, 14 September 2021.

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jumps from crisis to crisis. Although not insurmountable, wargaming for professional development will have to offer a more persuasive argument for continued existence and growth.⁵

In chapter 4, Kearney outlines best practices for developing on-the-job training for aspiring wargame designers, such as using commercial wargames and using professional wargaming organizations. This builds on the longstanding master-apprentice structure of teaching wargame design within the field.⁶ Although expedient in forging designers, the master-apprentice structure is limited in its volume and inherently possesses an outsized risk in passing on biases in one's learning, stemming either from the master or the institution. Furthermore, on-the-job training for designers presumes an aspiring designer can qualify for said position in the first place. This may be the case for uniformed servicemembers who can fill such wargaming billets (often at the capricious whims of the Service), but this is not true for their civilian counterparts. Thus, this begs the question: How does one get experience to get a wargaming job where you can learn how to be a wargamer? This vexing conundrum faces most aspiring wargamers who did not serve in uniform, which may contribute to the severe lack of diversity in the field.⁷

In chapter 5, Jenkinson and Brick outline their experiences when instituting wargaming for PME at the Australian Defence College, including specific obstacles and lessons learned. The authors highlight the importance of concurrent and overlapping lines of effort to push their wargaming initiative forward. Additionally, echoing Hunter, Brown, and Herbold, they emphasize the importance of faculty support and the various constraints of time and effort required. These are hard-won les-

⁵ Sebastian J. Bae and Major Paul Kearney, "Use Wargaming to Sharpen the Tactical Edge," *War Room*, 8 March 2021.

⁶ Sawyer Judge, "The Wargaming Guild: An Art or Science?" (presentation, Connections 2021, Fort Leavenworth, KS, 21–25 June 2021).

⁷ Caitlyn Leong, "How to Raise a Wargamer," *PAXsims*, 21 May 2020; and "No Playing Around When It Comes to Wargaming," *IDA Insights*, March 2022, 2–5.

sons repeated by other institutions, such as the Marine Corps University and Georgetown University.⁸ Although this chapter provides one of the two non-American perspectives on educational wargaming in this volume, it is important to highlight the largely Anglo-American perspective in this volume.⁹ The absence of other regional perspectives on educational wargaming is a critical shortcoming. It is our collective hope that our counterparts in Asia, South America, and elsewhere will add their voices to this growing literature with their own experiences and perspectives. As wargamers, we are keenly aware of the importance of context.

In chapter 6, Brown and Herbold discuss the ongoing process of institutionalizing educational wargaming in the U.S. Marine Corps through wargames such as *Fleet Marine Force: INDOPACOM, TOAWIV*, and *Command*.¹⁰ This chapter marks the latest renaissance in educational wargaming in the history of the U.S. Marine Corps, tracing its origins to the TACWAR family of educational wargames in the 1960s and 1970s.¹¹ Yet, this revitalization of educational wargaming is not limited to the Marine Corps, as reflected by the increased demand for games in the classroom across the joint enterprise.¹² Whether this trend of

⁸ “#7B—Tim Barrick,” *Controversy & Clarity*, podcast, 11 March 2021, 2:14:38 min.; and Sebastian J. Bae, “Establishing a Wargaming Insurgency at the University,” *Forge*, 14 December 2020.

⁹ Wojtowicz provides the other non-American perspective in the volume. She teaches at the Hague University of Applied Sciences.

¹⁰ *Fleet Marine Force: INDOPACOM* is the original title for the educational wargame designed by Sebastian J. Bae. However, due to issues with the U.S. Marine Corps trademark office, the title was changed to *Littoral Commander: Indo-Pacific* for its eventual commercial release by the Dietz Foundation.

¹¹ Sebastian J. Bae and Maj Ian T. Brown, “Promise Unfulfilled: A Brief History of Educational Wargaming in the Marine Corps,” *Journal of Advanced Military Studies* 12, no. 2 (2021): 45–80, <https://doi.org/10.21140/mcu.j.20211202002>.

¹² Col Christopher Hossfeld, “Getting War(Gaming) Back into the War College,” *War Room*, 11 September 2020; Javier Chagoya, “Game On! NPS’ Wargaming Week Ties Tactics, Strategy to Improve Defense Planning,” Office of University Communications, Naval Postgraduate School, 23 June 2021; and James Sterrett, “Practical Lessons from Teaching Online with Wargames at CGSC,” *PAXsims*, 7 September 2020.

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educational wargaming will continue or if it will be relegated again to the shadows of analytical wargaming remains to be seen. For now, the demand for educational wargaming continues to rise, but the resources and tools to meet the demand remain elusive.

In chapter 7, Appleget and Burks highlight how to better educate wargame sponsors on the value and limitations of wargames, based on their experiences designing and teaching wargames at NPS. This chapter is a wonderful extension of their recent book, *The Craft of Wargaming*, which provides a clear introduction and guide to the methodology of wargaming.¹³ Unsurprisingly, both their chapter and the book aim to increase wargaming literacy across the DOD and Joint enterprise. Echoing Elizabeth Bartels in her article, “Building a Pipeline of Wargaming: A Two Track Solution,” the authors aim their educational efforts beyond just wargamers and designers, but to the consumers and sponsors of wargames.¹⁴ Admittedly, much of the wargaming discourse can be insular and self-directed, wargamers speaking to other wargamers. However, this chapter examines the consumer perspective of wargames, building on similar works by Jon Compton, a senior analyst in the Office of the Secretary of Defense.¹⁵

In chapter 8, Valeriano and Jensen argue that wargames can serve as powerful research tools for social science by highlighting both recent successful cases of its implementation in academia and its remaining challenges to wide-scale use. As mentioned in the chapter, the authors build on a growing literature of wargaming applications in social science and

¹³ Jeff Appleget, Robert Burks, and Fred Cameron, *The Craft of Wargaming: A Detailed Planning Guide for Defense Planners and Analysts* (Annapolis, MD: Naval Institute Press, 2020).

¹⁴ Ellie Bartels, “Building a Pipeline of Wargaming: A Two Track Solution,” *War on the Rocks*, 14 November 2018.

¹⁵ Jon Compton, “The Obstacles on the Road to Better Analytical Wargaming,” *War on the Rocks*, 9 October 2019; and Jon Compton, “What Is Analytical Wargaming,” Georgetown University Wargaming Society, YouTube video, 25 September 2020, 1:36:11 min.

academic research.¹⁶ This includes the pioneering works by Lin-Greenberg, Pauly, and Schneider, exploring the applications of wargaming for international relations research, such as the International Crisis Game.¹⁷ Likewise, Goldblum, Reddie, and Reinhardt utilized *SIGNAL*, an experimental wargame, to explore nuclear conflict escalation.¹⁸ Barzashka of King's College London similarly raises questions about wargaming as an academic discipline and the associated obstacles to achieving this vision.¹⁹ This chapter adds to the rapidly expanding literature on the topic, challenging the long-held norms of wargaming as the exclusive domain of the profession of arms and defense policy.

In chapter 9, Taylor argues that educational wargaming can bridge the gap between the DOD and Congress, particularly in the case of nuclear policy. As mentioned in the chapter, in 2020, Representative Mike Gallagher (R-WI) argued for greater participation by Congress in DOD wargaming, particularly in relation to the Navy's Battle Force 2045. Both Taylor and Gallagher argue that wargames can serve as powerful mediums to engender cross-organizational collaboration, understanding, and policy. Fundamentally, this stems from the same value proposition in

¹⁶ Ellie Bartels, "The Science of Wargames: A Discussion of Philosophies of Science for Research Games" (paper presented at War Gaming and Implications for International Relations Research, MIT, CIS, and U.S. Naval War College Workshop, Endicott House, MA, 2019).

¹⁷ Erik Lin-Greenberg, Reid B.C. Pauly, and Jacquelyn G. Schneider, "Wargaming for International Relations Research," *European Journal of International Relations* 28, no. 1 (March 2022): 83–109; and Reid B. C. Pauly, "Would US Leaders Push the Button?: Wargames and the Sources of Nuclear Restraint," *International Security* 43, no. 2 (2018).

¹⁸ Bethany L. Goldblum, Andrew W. Reddie, and Jason C. Reinhardt, "Wargames as Experiments: The Project on Nuclear Gaming's SIGNAL Framework," *Bulletin of the Atomic Scientists*, 29 May 2019; and "SIGNAL," Project on Nuclear Gaming, Berkeley.edu, accessed 18 April 2022.

¹⁹ Ivanka Barzashka, "Realizing a Vision of Wargaming as an Academic Discipline," Georgetown University Wargaming Society, YouTube video, 15 December 2020, 1:28:33 min.

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terms of Joint or cross-Service wargaming.²⁰ However, there are serious concerns about the involvement of Congress in wargames. Chief among them being the powerful temptation to bias the wargame to advance a specific Service or organizational agenda. This pathology of wargaming, where advocacy masquerades as objective wargaming, is especially dangerous when millions, if not billions, of funding may hang in the balance. Furthermore, in a wargaming ecosystem where most of the expertise exists within the DOD enterprise, this model of congressional wargaming risks producing myopic perspectives of policy challenges overly focused on the military dimension of national power.²¹ Nevertheless, this chapter reiterates the challenge to the broader wargaming community—How can Congress be an active participant in the wargaming process or at the very least, be a better consumer of wargames?

In the end, nine chapters comprise this edited volume, each offering their own insights and recommendations for the way forward. Some of the chapters converge in their conclusions, despite markedly different starting points. Meanwhile, other chapters forge their own path into the wargaming literature. Yet, all the authors recognize there is still much to be done in the process of forging a wargaming pipeline, connecting the disparate islands across the wargaming ecosystem. This includes, but is not limited to, producing a wargaming continuum from precommissioning education to PME, crafting a more persuasive argument for resources and time for educational wargaming, and better integrating the design process with the consumers of wargames. As a result, like wargames, this edited volume does not provide unassailable, validated solutions but highlights better questions to improve understanding.²²

²⁰ Mike Gallagher, "Bringing Congress to the (Wargaming) Table for a Bigger and Better Navy," *War on the Rocks*, 19 October 2020.

²¹ "Congress Should Be Wargaming (but Not Battle Force 2045)," *PAXsims*, 21 October 2020; and Rex Brynen, "Gaming for Congress?," *PAXsims*, 19 October 2020.

²² Peter P. Perla et al., "Rolling the Iron Dice: From Analytical Wargaming to the Cycle of Research," *War on the Rocks*, 21 October 2019.

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The way forward for the wargaming community is dimly lit and fraught with obstacles, both known and unknown. Nonetheless, we must press forward, armed with better questions and greater understanding, to forge a new generation of wargamers.

As befits wargamers, the die is cast, and now tumbles across the table—but the result is yet to be determined.

Sebastian J. Bae

Editor and Working Group Chair

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