

Building the Navy Battle Lab

By Mr. Robert Kozloski **

General Robert Neller has always been regarded as a tough, no-nonsense Marine, and as Commandant of the Marine Corps he has also emerged as a genuine visionary. He deeply understands the future military environment and how his service must prepare for it. At the 2016 AFCEA West Conference, the general provided critical [insight](#) into his vision, which closely [aligns](#) with that of Chief of Naval Operations (CNO) Admiral John Richardson, on the direction of leadership development in the Naval Services should take.

According to the 37th Commandant:

I think the training systems we have as far as simulators and simulation are pretty good for individual task/condition/standard, for air crew, for drivers, for even firing individual weapons, gunnery, things like that, I think the thing that we're looking for is, where's the equivalent of our Holodeck, where a fleet commander or division commander or air wing commander can go in and get a rep. Right now that almost requires an actual provision of the real stuff, which is really expensive.... Where's our Enders Game battle lab kind of thing where we can not just give our leadership reps, but we can actually find out who the really good leaders are.

General Neller's comments compel us to further analysis. He invokes aspects of popular science fiction to paint a picture for how leaders will be trained, evaluated, and readied for operational challenges in the not-so-distant future. He identifies critical gaps in today's approach to leadership development, where mid- and senior-grade officers have few opportunities to experiment with novel operational concepts, using multiple units, in a risk tolerant environment. He also places cognitive development, or military decision-making, on par with the physical fitness which has long been a hallmark of Marine Corps officers. Finally, Neller highlights the problem of assessing the true quality of leadership in today's ranks, where a significant portion of an officer's career is in non-operational assignments.

One Army [study](#) of the novel Ender's Game describes the "battle lab" (or school) in this way:

Using virtual training environments, the children go head-to-head on an individual level against computers that simulate Formic battle tactics to gain the knowledge and abilities required to defeat the enemy. The children can then compete against one another in the virtual environments to further develop their strategies. The next phase involves live collective training. Divided into armies, the soldiers must learn to function as a single unit to accomplish a mission

objective in the battleroom. With enough skill, soldiers can become commanders of their armies and must learn to lead them effectively. By merging these individual and collective training components, the soldiers' knowledge, skills, and abilities can translate into operational readiness.

While the concept of an Ender's Game battle lab may seem like pure fantasy to some, the technology to build it may be right around the corner. In order to turn Neller's vision into reality, several organizational changes must occur.

Harnessing advances in several emergent fields is critical for creating a naval battle lab, but we must exercise prudence in our approach. We must take full advantage of better private sector platforms and systems, and make using them our first choice, rather than taking the more expensive approach of designing our own systems. Reinventing the wheel, and the resulting exorbitant costs, will be the death knell of a naval battle lab long before the project would get underway in earnest.

As the current [Pokémon Go](#) craze clearly demonstrates, working augmented reality is now widely available to the public at virtually no cost. If built from scratch using the defense acquisition process, its cost surely would render such a system unaffordable. In fiscally constrained times, the DON must adopt new business practices and modernize outdated IT policies to capitalize on these types of commercial initiatives. Senior leaders and acquisition professionals need to consider open source software (OSS) services, such as [GitHub](#), as the new norm for software procurement. OSS services allow users to take available code and modify it for a specific use at potentially a much lower cost than developing their own version from scratch or purchasing a commercial software license.

Another form of technological advancement needing consideration is the rise of machine learning and "bot" technology. Sophisticated software algorithms show great utility in modern computer networks, with their ability to monitor computer systems, offer data access, and to check network activity, while adapting themselves to varying conditions without human direction. This capability is being commercially used to improve [customer service](#) and to monitor [network activity](#), among other private sector functions. Such advanced machine learning tools will be critical for creating virtual exercise controllers or simulated adversaries, using their adaptable artificial intelligence to challenge military tacticians based on their level of expertise.

Mobility will be an important enabler for leadership development in the future. It is difficult to find a naval officer today who does not own a smart phone. We must take advantage of these powerful tools by providing our people with appropriate network access and software to enable them to participate in scalable leadership exercises alone or as members of a networked team. Such access will allow them to develop professionally wherever they are. In short, we must make [cognitive development](#) as accessible as doing a set of push-ups. Leveraging commercial technology, however, is only one part of the changes required to implement General Neller's vision.

The naval services have led at [wargaming](#) for decades. Over the past few years, [improvements](#) to analytical methods have resulted in game outcomes informing organizational decision-making

processes. However, we must not lose sight of the fact that wargaming, and gameplay in general, serves as an excellent leadership development tool. In essence, traditional wargaming is a competition among participants based on a scenario that is conducted in a turn-based manner. They make people think and solve problems. This same process is easily replicated, repeated and expanded by using a virtual environment.

Virtual wargaming offers many advantages over traditional simulations. Consider popular online games such as *World of Warcraft* or *Call of Duty*. These games are played by millions of networked participants around the world every day. Fundamentally, they are designed to pose tactical problems to players who have a set of options from which to select. This interaction presents an incredible opportunity both to learn and collect useful data on military decision making.

In the future, for example, tactical problem X could be posed to a large and diverse group of naval officers in a virtual game format. From their answers, it would be possible to determine that a certain percentage would chose option Y, while others would chose option Z. This data could then influence policy changes or improve training and education programs, using any observed shortfalls. Further, if this virtual environment is shared with other services and coalition partners, it will be possible to determine the effect service and national culture has on tactical decision making.

Another advantage of virtual gaming is its ability to draw upon the expertise of the crowd to solve challenging problems. This is contrary to the norm of giving only a few elite players the opportunity to participate in large-scale events. Virtual environments are also more accommodating to various personality types and better for overcoming the power dynamics and hierarchies associated with the traditional approach to military wargaming.

The DON is at the forefront of crowdsourcing in the Department of Defense through its use of online platforms such as [MMOWGLI](#), [The Hatch](#), and the [Marine Corps Innovation Challenge](#). Each of these forums provides Sailors, Marines, and DON civilians the opportunity to participate in virtual problem solving challenges. The lessons from these nascent systems could influence operational planning in the future, as the multitude of options available to our adversaries could be given to a network of operational planners, rather than myopically focusing on one or two likely courses of action. History has shown the current approach to planning often results in failure to anticipate our adversaries' actions, an inflexibility we must remedy.

Virtual games are only as good as the environment in which they are conducted. Commercial gaming technology, geographic information systems, intelligence collection sensors, and repositories of global societal data are constantly improving. Much work remains to integrate these various sources of data in order to develop virtual environments of sufficient quality to enable realistic decision-making exercises. Excessive emphasis on environmental fidelity can often become an expensive distraction, however.

Virtual environments may be used to represent complex, networked, “wicked problems” better, as well as demonstrating the impact of our actions within, for example, complex civilian population centers. In short, virtual environments can present a different set of decision making

problems and feedback mechanisms not available in live training exercises or traditional war games. This is yet another advantage offered by new forms of simulation.

The term “game” often connotes a recreational activity. If gameplay in the battle lab of the future is to become an effective tool for assessing the tactical decision making of naval leaders, proper incentives must be put in place so these exercises are taken as seriously as time on the rifle range. The emerging concept of [gamification](#) rests upon rewards or meaningful status upgrades to reinforce positive behavior, while penalizing negative behavior. Performance in the naval battle lab consequently must be incorporated into annual performance assessments and ultimately influence career decisions.

In an examination of military innovation, [Dima Adamsky](#) notes a significant difference between the US and Soviet militaries during the Cold War in their approaches to technological adaptation. The Soviets would develop concepts and strategy for use ahead of delivering a technology, whereas the US military usually had the technology and then often took a decade to figure out how to turn it into an operational advantage. To prevent this problem in the future, DARPA and ONR could insert the latest weapons technology into the battle lab years ahead of its actual fielding. This would give future naval leaders the opportunity to experiment with weapons of the future, then speedily integrate them into their decision making cycle as soon the new systems arrive in the operating forces.

The DON’s Task Force Innovation was comprised of over 150 naval innovators from across the operating forces. Improving [wargaming](#) and expanding [virtual environments](#) were identified as important tools to promote innovative thinking. As a result, Secretary Mabus directed two policy memos to emphasize these two issues and take an integrated naval approach, when possible. While great progress is being made as a result of these directives, these two areas will ultimately form the foundation for a naval battle lab and must proceed in parallel and complement one another.

To operationalize this concept, the numerous stakeholders from across the naval enterprise must work towards a common vision. Developing the functional system as described here will require strong leadership and collaboration across numerous DON organizations. As we have seen, this topic is of great interest to the SECNAV, CNO and CMC. Therefore the current bureaucratic environment may be optimal to make meaningful progress.

There are many technical, fiscal, and organizational barriers which must be overcome to fully operationalize the naval battle lab concept. The most significant obstacle, however, will be cultural. Ultimately our leaders must see the lessons learned from traditional leadership tasks and day-to-day decision-making in an operational environment are invaluable and cannot be supplanted. As cognitive decision-making emerges as a critical capability on the battlefield of the future, we must leverage every opportunity to build the most tactically and operationally proficient naval officers possible. As we see in every aspect of society, technology will play a vital role. If a battle-hardened, infantry Marine like General Neller, who entered military service long before personal computing became part of our daily lives, recognizes the potential of a naval battle lab for building and testing naval leaders, others must take notice too.

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