Perfecting the Instrument: Learning Operations at the Beginning of Campaigns

Poznatky získané na počátku operace, jako vhodný nástroj přípravy

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Abstract   Uncertainty is a constant in war. Militaries regularly go into conflicts with operational concepts that are not relevant in the face of the enemy and his plans. The authors propose a way to reduce uncertainty and rapidly check, then adapt, the operational concept — designed learning operations at the beginning of campaigns. These relatively small operations will create friction with the enemy, giving learning teams crucial information to assess their operational concepts. Learning operations offer conventional militaries a way to maximize their advantages over sub-state enemies, by concentrating learning at the outset of the fight and adapting first.

Abstrakt   Nejistota je ve válce všudypřítomná. Operačními plány, se většinou dostávají do rozporu s reálnou bojovou situací. Autoři článku navrhují způsob, jak snížit počáteční nejistotu, rychle se zorietovat a na záklladě toho přizpůsobit operační plán, s využitím prvních poznatků, získaných hned na počátku operace. Poznatky získané na začátku operace, které vychází z prvních střetnutí s protivníkem, mají "vzdělávací" charakter a poskytnou štábům důležité informace pro adapraci operačních konceptů. To umožní maximalizovat své výhody před vojsky protivníka.

Keywords: Adaptation; Friction; Israel; Israel Defense Force; Protective Edge; Learning; Learning Operations; Military Learning; Organizational Learning.

Klíčová slova: Adaptace; bojové střetnutí; Izrael; Izraelské ozbrojené síly; ochrana vojsk; vzdělávací operace; vojenské vzdělávání.

INTRODUCTION

Carl von Clausewitz's dictum, "War is the realm of uncertainty," describes a challenge that has preoccupied generations of military commanders and thinkers. Uncertainty and surprise are persistent problems for all those involved in armed conflict.

The struggle to understand the enemy – and ourselves – is especially challenging and vital at the outset of conflict. "War must always start with imperfect instruments," writes combat historian S.L.A. Marshall.[1] No matter how much time and thought leaders invest into understanding the forces facing them, they will inevitably be surprised. Intelligence will be incomplete, the concept partially irrelevant, and their soldiers inadequately trained. But commanders go to war with the force they have, and the quicker their system is able to understand surprise and adapt accordingly, the less they will pay for their unreadiness.

The Israel Defense Force (IDF), despite its impressive record of adaptation and innovation, has encountered this reality no less than other capable militaries. At the beginning of the 1973 Yom Kippur War, Israel experienced a painful and costly shock. Israel's operational concept, the "Sela Plan," held that if the Egyptians crossed the Suez Canal, then the IDF would rapidly move to the offensive to prevent them from achieving any military gains. But the concept proved inadequate once it encountered the enemy. The massive tactical use of RPGs and Sagger missiles brought the Israeli counterattack to a grinding halt. Israel knew that it would meet these weapon systems, but did not anticipate how they would be employed, their scale, and their psychological effect. It was quickly clear that Israel's operational concept going into the war was not relevant for the enemy it faced in reality.

Israel's concept was flawed in other key assumptions, including the deployment at the front lines, the call-up of reserves, the scope of the Egyptian canal crossing, and the impact of anti-tank weapons on IDF maneuver. This gap in relevance was only closed after a rapid and ultimately successful learning process under fire, which resulted in a new concept that matched the enemy they were facing in the field, not on Israeli training grounds.[2]

One need not look back very far to find other examples of the IDF entering a fight with plenty of intelligence, but a faulty concept that cost it dearly. In Operation Protecti-

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[1] S.L.A. Marshall, *Men Against Fire: The Problem of Battle Command,* (Norman: University of Oklahoma Press, 1947), 20.

[2] Meir Finkel, *On Flexibility: Recovery from Technological and Doctrinal Surprise on the Battlefield* (Tel Aviv: Ma'arachot, 2007), 101-105, 200-201. (Hebrew)

ve Edge in 2014, Israel had ample intelligence about Hamas's massive tunnel-building project. But both the operational and strategic levels failed to understand the implications. The realization that the tunnels were the heart of Hamas's offensive effort only set in once the fighting started.[3] "We were familiar with the tunnels before," explained MG Sami Turjeman, head of the Southern Command during the conflict. "What we didn't understand was the number of tunnels in our territory and in theirs, how they were used, their scope, and how they were woven into offense and defense."[4] This led to a new operational concept of forward defense against the tunnels, instead of simply attacking from the air and protecting the border, conceived of by the Southern Command.[5]

Other Western forces have also been forced to change their concept after an initial surprise. US and British troops in Tunisia were roundly defeated at Kasserine Pass in 1943 by Gen. Erwin Rommel's smaller Axis force. The Americans hadn't adequately prepared for the modern battlefield in the interwar period,[6] and it took them meeting German armored maneuver forces to grasp that fact.[7]

In the aftermath of the defeat, the Americans underwent a rapid learning process that affected US combat concepts and doctrine throughout the war. The learning process after the first major US battle against the Germans was a key element of the US adaptation against the Wehrmacht.[8]

1   LEARNING OPERATIONS

"There is nothing like actually engaging with the enemy to test all your concepts and thinking and planning."

Military historian Daniel Marston[9]

How can Israel, the US, and other conventional militaries minimize surprise at the beginning of wars, and lower the cost of learning? Furthermore, as they continue to battle sub-state organizations, how can Western militaries use their own inherent advantages to win the learning competition against adaptive and creative foes?

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[3]   Meir Finkel, "Learning Operations at the Beginning of Combat – On Attack Tunnels during Operation Protective Edge," Ma'arachot 457 (2014), 16.

[4]   Interview with MG Sami Turjeman, April 25, 2018.

[5]   Yoav Ziton, "The IDF enters with Major Ground Forces into Gaza," Ynet, July 14, 2014. https://www.ynet.co.il/articles/0,7340,L-4545568,00.html. (Hebrew).

[6]   Brian McAllister Linn, *The Echo of Battle - The Army Way of War*, (Cambridge: Harvard University Press, 2007), 117-149.

[7]   Blumenson, *Kasserine Pass,* 261.

[8]   Jessica Marie (Timmerman) Kunert, *Command and Initiative in North Africa: Patton vs. Fedendall, and the Battle of Kasserine Pass - A Thesis Presented to the Faculty of the Department of History East Carolina University*, (2016), 82; SHERWOOD, pp. 83-133.

[9]   Daniel Marston, "Rise of the Phoenix: The XIV Army in Burma," lecture at *Chief of Army History Conference 2017*. https://www.cove.org.au/breakin/video-chief-of-army-history-conference-2017-prof-daniel-marston/

These organizations enjoy some advantages, especially their flexible dispersed structure and their ability to quickly adapt tactically and surprise our forces. But conventional forces can concentrate massive force and firepower, and if done at the right time and place, it can overcome the advantages of non-state organizations.

Concentrating force is also the key to winning the learning competition.[10] While groups like Hezbollah or the Taliban face challenges in accumulating and disseminating information across their dispersed force in war, the IDF and US military can quickly gather information from multiple fronts, examine and learn, and spread lessons to all its forces.[11]

This inherent advantage can provide the crucial edge at the outset of the fight, when conventional forces can gain an understanding of the enemy concept of operations and adapt after a small number of encounters. To take full advantage of this opportunity, and to reduce the price of entering a war with "imperfect instruments." this study proposes designing the opening battles of a campaign as both learning events and as traditional actions meant to gain tactical advantage over the enemy.

The idea of concentrated learning operations at the outset of campaigns has significant implications for the way force is designed and employed. It also brings to the surface important tensions that must be addressed. This work will deal with these issues, and will propose a framework for operationalizing the idea. If done properly, learning operations at the beginning of campaigns can save blood and treasure, by offering substantial advantages in the learning competition that decides so many conflicts.

 The idea of designed learning operations is not entirely new. The Australian Defence Force (ADF) describes "Discovery Actions" in its *Army's Future Land Operating Concept.* In the "Act" phase of "Adaptive Action", the concept describes the Land Force probing the system "to test or confirm its understanding of the battlespace. As an example, before committing to an attack on a defensive position small teams may go forward and probe the defences of the position to confirm their understanding of the defensive position and the likely enemy reactions to contact."[12]

The ADF distinguishes between "discovery actions" and "decisive actions." The latter should be done once the force has developed a sufficient understanding of the battlespace, according to the concept, "normally by cycling through at least one iteration of the Adaptation Cycle."[13] In other words, the main effort should be held back until an initial rapid learning process is completed, one that is accomplished through interacting with the system.

IDF Dado Center commander BG (res.) Dr. Meir Finkel takes the idea a step further, arguing for designed learning operations specifically at the beginning of the campaign. Using historical case studies from the IDF, Finkel underscores the importance of learning from action, and how difficult it is to truly grasp the enemy's intentions without

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[10] Interview with Meir Finkel IDF Dado Center Commander, April 12, 2018.

[11] Interview with Eado Hecht, Academic Instructor at the IDF Command and Staff College, April 2, 2018.

[12] Australian Army Headquarters, *Army's Future Land Operating Concept,* (Canberra, 2009), 33. https://www.army.gov.au/sites/g/files/net1846/f/acfloc_2012_main.pdf

[13] *Ibid.*

interacting with it. He distinguishes between knowledge and understanding, arguing that understanding comes from friction with the enemy. He proposes "a type of action--response operation whose purpose is to form IDF understandings at the beginning of the conflict, before sending the main force into action."[14] Finkel focuses on tactical learning about enemy capabilities, including testing air defenses and innovations in ground combat techniques.[15]

Though the IDF has no doctrine for learning operations, a senior commander decided to do something quite similar on his own initiative. At the beginning of Protective Edge, MG Turjeman felt he had too many unresolved questions around how Hamas would operate. He sent three separate brigades to different sectors to "feel out" the enemy before committing the preponderance of his forces to the fight. He preferred to refrain from employing all of his ground forces at once, instead using the brigades for learning lessons to better prepare the force for the rest of the campaign.[16]

This study seeks to further develop the ADF idea of discovery actions, Finkel's learning operations at the opening of campaigns, and what Turjeman improvised during Protective Edge. It will propose learning operations at the beginning of campaigns in order to test our own operational concept, and its relevance in light of the enemy's concept. It will also offer specifics on how the learning cycle is done and who carries it out.

2   THE LEARNING COMPETITION

The importance of learning in all competition, especially military conflict, is broadly accepted. The question of how to learn is much more complex. This is especially true during war, when learning must be rapid enough to influence the outcome, while still robust enough to reach the right conclusions.

 Learning under fire faces another obstacle- the inescapable fact that though it rests on gathering accurate information and correct interpretation,[17] it will always be done with insufficient knowledge. Military learning - as in the business world - is the "art of making meaningful generalizations out of inadequate facts."[18] The attempt to understand the enemy, his capabilities, and his intentions are always contingent on our ability to bridge gaps in information, and picture the entire iceberg from the small portion above the water. The time element makes it even more difficult to gather enough information, as conclusions must be drawn and spread to the force as quickly as possible.

Though it is certainly possible – and cheaper - to learn from passive observation, there is much knowledge that can only be gathered actively. Sun Tzu advocated this: "Rouse

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[14] Finkel, "Learning Operations," *Ma'arachot*, 17.

[15] Finkel, "Learning Operations," *Ma'arachot*.

[16] Interview with Turjeman, April 25, 2018.

[17] Interview with Eado Hecht, April 2, 2018.

[18] David Garvin, *"Learning in Action: A Guide to Putting the Learning Organization to Work,"* (Boston: Harvard Business School Press, 2000), 25.

him, and learn the principle of his activity or inactivity," he wrote. "Force him to reveal himself, so as to find out his vulnerable spots."[19]

Senior IDF generals have come to the same conclusion. MG Nadav Padan, 162nd Division commander in Protective Edge, described his experience learning from engaging with the threat of tunnels as "the difference between learning driving theory and getting behind the wheel yourself." [20]

"We were familiar with the tunnels mainly in theory," Padan reflected. "We did not have operational experience. There is something in the friction, in the experience, that accelerates understanding. We internalized it all only while dealing with the tunnels."[21]

The idea that wartime friction leads to a far deeper understanding of the enemy than passive observation lies at the heart of learning operations. But important questions remain. What exactly are we trying to learn? How long is this opening stage? How long does the learning cycle last? Who is responsible for the learning process?

This study addresses these and other core issues as it fleshes out the idea of learning operations at the beginning of wars.

3   LEARNING OPERATIONS AT THE BEGINNING OF CONFLICTS

Militaries must examine a wide range of issues during war, from the tactical level up to the strategic. Opening battles are important venues for tactical learning on enemy capabilities and on how they intend to employ them. BG Finkel proposes tactical learning operations. It is also possible to learn on the operational level from opening battles, including reexamining the relevance of our own operational concept in light of what we learn on that of the enemy.

There are many definitions for "operational concept." The 1996 IDF military terminology dictionary defines it as "a concept that defines how to manage combat operations (maneuver), fires support and logistical support, and what that tasks and roles of the various echelons are in war."[22] The 2016 version of the Core Security and Defense Documents changes "operational concept" to "force employment concept", which "defines the unit's main idea to carry out what it is tasked to do...the purpose of this concept is to establish the fundamentals of every type of operation that unit is expected to carry out."[23]

Though the specific definitions vary, at its core the operational concept is the main idea of how to carry out a unit's missions with the tools at its disposal. It is akin to a "theory of a business" from the management world, which describes the set of shared assumptions about markets, customers, technology, and the organization's missions and

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[19] Sun Tzu, *The Art of War,* Chap. VI, 23.

[20] Amos Harel, "Top General in Gaza War: We Could Have Retaken the Strip", *Haaretz*, October 10, 2014.

[21] *Ibid.*

[22] IDF J3-TRADOC, *The Dictionary of Doctrine Terms,* (1998), 659. (HEBREW)

[23] IDF J3-TRADOC, *Core Security and Defense Documents,* (2016), 39-40. (HEBREW)

competencies.[24] In the military and in the business world, this "theory" provides "consistent, cohesive frameworks for interpreting events and guiding behavior."[25]

Operational concepts eventually become obsolete – indeed, they start moving toward obsolescence the very moment they come into being. As such, they must be tested and updated continually.[26] There is no test like the encounter with the enemy for whom the operational concept is designed. The earlier that test is done, the smaller the price our forces will pay for the flaws in our initial concept.

A core principle is the creation of friction, that understanding comes from an encounter with the problem, in this case, in fighting the enemy. Therefore, contact must be made with the enemy to accelerate the learning process.

This idea is similar to the US "reconnaissance by force" concept. Reconnaissance units entice the adversary to react by carrying out tactical actions against him, in order to make him reveal himself. Though the US concept seeks to gain tactical information, with the right adjustments it is also possible to learn about the enemy's operational concept through tactical encounters, and ultimately test the relevance of your own.[27]

Testing the operational concept demands a sufficiently robust set of information in order to draw accurate conclusions. But it also needs to be done as rapidly as possible in order to protect the force. The information with which the current concept is tested comes from contact with the enemy in the form of battles. This study points to the opening battles in a campaign, but what exactly are the opening battles? How much input is needed, while still achieving speedy results to inform the rest of the campaign?

Though there is a certain benefit from committing a large number of units to learning operations, the cost is high. The forces that enter the fight before the operational concept is tested are especially vulnerable, and are less effective. To draw a hypothetical mathematical expression of this idea – If our units are 70% effective under the existing, flawed, concept, they might be 90% effective with the new, updated operational concept. Having the minimum numbers of units fight at 70% effectiveness saves lives and treasure. Consider how many soldiers and tanks could have been saved in 1973 if the main IDF force was able to enter the fight after a small, learning operation had forced the Egyptians to reveal their new use of anti-tank missiles and guns.

Still, multiple units in separate sectors must be involved in the opening learning operations. This offers a measure of protection from deception or overemphasizing a particular fight against a particular unit or commander, by allowing learning teams to study indications from multiple encounters.

Time is of the essence. With the preponderance of the force waiting for the initial learning process to be completed, the enemy must be found, engaged with, and lessons must be learned. The initial encounter from which we learn need not take longer than

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[24] Peter Drucker, "The Theory of the Business," *Harvard Business Review,* (September-October 1994). https://hbr.org/1994/09/the-theory-of-the-business

[25] David A. Garvin, *"Learning in Action: A Guide to Putting the Learning Organization to Work,"* (Cambridge: Harvard Business Review Press, 2000), 25.

[26] *Ibid.*

[27] Headquarters, Department of the Army, *FM 3-90: Tactics, Chapter 13.*

a day or two, as the primary goal of the battle is not to reach a decision, but to test our concept while gaining a tactical advantage for when the main force commits to the fight. The whole learning process needs to be completed – including distribution of the findings to the units in the field- within 3-4 days. Otherwise, the enemy is given too much time to prepare, and to even learn about us as we seek to learn about him.

It is important to emphasize that learning operations should not be the only source of learning, both tactically and operationally. Learning by a relatively small number of units leaves the force vulnerable to the possibility of learning lessons that are too broad, and to deception. "Therefore," said Finkel, "this process does not stand on its own, and must be supported by parallel processes in the intelligence realm."[28]

With the idea of learning operations at the beginning of campaigns established, the practical questions must be addressed. Who is responsible for carrying out the learning? How exactly is it done? How quickly must it be done? How are the findings disseminated throughout the force? What kind of intelligence and training is must be introduced for these operations? This section will address those questions. Despite the specific circumstances of any particular campaign, the answers provided here are meant to serve as a framework relevant to all campaigns.

The 2005 RAND Corporation study, "Aptitude for Destruction: Organizational Learning in Terrorist Groups and its Implications for Combating Terrorism," lays out four elements for organizational learning processes – acquisition, interpretation, distribution, and storage.[29] This serves as a useful model for the stages of learning operations, and who carries out each component.

Acquisition refers to the gathering of information and knowledge that contribute to the organization's activities. There are external sources of knowledge, such as observing the experience of others, joint learning processes, the use of outside experts, and more. In addition, there are also internal sources, including congenital knowledge that members of the organization bring with them, internal knowledge development, and learning through action - that is, friction.

Interpretation is evaluating and providing meaning to the information acquired, within a reasonable amount of time.

Distribution is how the new knowledge reaches the relevant individuals and teams within the organization. It refers to both to distribution of information to those who interpret it, and the distribution of analysis and knowledge to those in the field.

Storage is what makes the learning organizational. It means that it does not belong to particular individuals, and the loss of individual leaders does not mean the learning is lost. It remains in the organization, and continues to influence and contribute to the organization over time.

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[28] Interview with Meir Finkel, April 12, 2018.

[29] Brian A. Jackson, with John C. Baker, Kim Cragin, John Parachini, Horacio R. Trujillo, Peter Chalk„ *Aptitude for Destruction: Organizational Learning in Terrorist Groups and it Implications for Combating Terrorism*, Volume 1 (2005), 6-12. https://www.rand.org/content/dam/rand/pubs/monographs/2005/RAND_MG331.pdf

3. 1   Acquisition

Though there are many methods of acquisition, the goal of learning operations is to gain knowledge through combat friction with the enemy. The acquisition is done by teams attached to those brigades fighting in learning operations. A lone brigade is vulnerable to deception and to learning the wrong lessons from one encounter. We propose three separate brigade-sized learning operations to create enough friction in different locations against different commanders to have a sufficiently robust set of information to analyze.[30] Three brigades still constitute a relatively small force being exposed to the flaws of the original operational concept.

One approach proposes all three brigades coming from a single regional division. This allows them to support each other in combat, and would force the enemy in that sector to go deep into his toolkit to counter a significant incursion force. In addition, it enables the division commander to gain an accurate picture of the enemy and offer his insights to the regional command. On the other hand, brigade teams from separate regional divisions ensure that learning comes from entirely different sectors, allowing multiple division commanders to report back to the regional command. This study sees the merits in both approaches, and leaves the decision on which is more appropriate for the particular campaign to the commander of the regional command/corps.

Dedicated acquisition and initial interpretation teams will be attached to each brigade. These teams will undergo training in gathering the knowledge necessary to gather relevant information to allow the higher echelons to test their operational concept. They must be well-practiced in observing combat and understanding what friction is saying about prior intelligence and operational concepts. This demands an intimate familiarity with both our own forces and the enemy's operational concept, deployment in the field, technological innovations, and how the enemy behaves in the field.[31] This will allow these acquisition/interpretation teams to identify enemy trends that influence the operational level, and to pass on relevant information to higher echelons.

These acquisition/interpretation teams will consist of two categories of members. The first, and core, group will be those already practiced in acquiring relevant knowledge from the battlefield. They need to be versed in the theory and practice of operational-level learning. The experts on these teams need sufficient familiarity with intelligence on the enemy, alongside deep familiarity with our own forces and concepts – knowledge of both J2 and J5 types. In the IDF, the key manpower would be historians from the History Division, and students and instructors from the Command and Staff College and the Tactical Command College.[32]

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[30] Interview with Turjeman, April 25, 2018; Raphael D. Marcus, "Learning 'Under Fire': Israel's improvised military adaptation to Hamas tunnel warfare", *Journal of Strategic Studies*, 2017, p. 19. Marcus envisions learning operations of two brigades but the authors argue that this is too small a force.

[31] Interview with LTC (res.) Dr. Dotan Druck, past Head of Doctrine in IDF Ground Forces Command, Glilot, Israel, March 22, 2018.

[32] Interview with LTC (res.) Dr. Eado Hecht, Academic Instructor at IDF Command and Staff College, April 2, 2018.

The second type of team members are meant to ensure the flow of information from the junior commanders in the field to the acquisition/interpretation teams. These individuals would sit in existing tactical learning teams that are already part of the tactical learning process, albeit with a different focus and pace of learning. In the opening days of a campaign, their experience and connections with the lower tactical levels is a crucial source of information for the acquisition/interpretation team, especially when tactical commanders might not prioritize passing information to operational learning teams.[33]

Still, these teams alone are not appropriate for answering operational-level questions, since their orientation, training, and pace is to study the tactical level during war. This element of the acquisition/interpretation team focuses on collection from the lowest tactical levels, while the other element orders that information in ways that will be useful for the operational learning team that sits in the regional command/corps, especially in identifying trends that point out problems in our operational concept.

3. 2 Interpretation

After the flow of information from the battlefield to the brigade-level acquisition/interpretation teams to the learning teams in the regional command, these inputs must be examined to understand what it is trying to tell us about the campaign and our operational concept.[34]

Assessment of the enemy operational concept starts well before fighting breaks out, using classic intelligence tools and processes. The learning teams attached to both the brigades and the regional command/corps (to be described shortly) should have already thought through what the adversary's core assumptions are, and how they might manifest themselves on the battlefield. Once the fighting starts, the brigade acquisition/interpretation teams carry out an initial estimation of what they are observing against what they expected, and on this basis provide a recommendation on whether a gap has opened between what the enemy is doing and our operational concept for defeating him.

This estimation, along with the battlefield information gathered by the acquisition teams, flows directly to the level of the corps, or in Israel, the regional command. The commander of the regional command is responsible for the learning for the campaign, and it is he who decides on the operational concept.[35] His learning team must also be made up of those who were involved in designing the operational concept, intelligence, operations, and be commanded by a senior officer, preferably a brigadier general. The seniority of this team is important, as they need to be able to engage in an open and productive conversation with the regional or corps commander. Their interpretation will influence

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[33] Steven Mains and Gil Ad Ariely, " Learning While Fighting - Operational Knowledge Management That Makes a Difference", *PRISM* 2, no. 3, 2013, pp. 170-171.

[34] Interview with Meir Finkel, April 12 2018.

[35] Interview with MG Turjeman, April 25, 2018.

the outcome of the entire campaign, and the corps commander must see the team as a useful asset whose recommendations should be taken quite seriously.

This team takes the information gathered and ordered from the tactical levels, and studies what the enemy is trying to do on the operational level, and what that means about the relevance of our operational concept.

A similar thinking and planning team was used by MG Turjeman during Protective Edge, which supported the commander during the fighting to identify and determine whether there was a conceptual relevance gap, and if it demanded a rapid design process to create a new one. The members of the small team possessed significant planning experience, were well-versed in the IDF concept, and enjoyed Turjeman's trust.[36]

The division, which was bypassed in the transfer of information and understandings from the brigade teams to those at the command, has a role to play as well. As the largest ground tactical formation, the division sits at the nexus of the tactical and operational. In the IDF case the regional division is responsible for a specific sector against an enemy it has been studying intensively. The division is close enough to the fight to identify differences in the way the enemy is behaving compared to our expectations, while high enough to be fluent in the Command's operational concept. The division serves as an additional sensor in the field for the Regional Command/corps.[37] The division commander is able to study what the brigades in the fight are seeing and experiencing, and provide insights that the Regional Command might miss because of their distance from the brigades carrying out the learning operations.

An important step in the work of the Command operational concept learning team is examining our core assumptions. These include anticipations of the character and essence of the coming campaign, enemy goals, the means of achieving them, and strategic questions like the reactions of neighboring countries and the international community.[38]

These assumptions are laid on the table during the design phase, where the original operational concept for a campaign is crafted. Such processes are led by senior leaders. On these core assumptions rests the operational concept.[39] Testing core assumptions in light of the initial stage of combat ensures they take a hard look at the very foundations on which the operational concept stands. Many of these assumptions will be found lacking in light of reality, and the corps/regional commander will have to decide on new core understandings with the help of his operational concept learning team.[40]

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[36] *Ibid.*

[37] Interview with LTC (res.) Dvir Peleg, Dado Center researcher, Glilot, April 16, 2018.

[38] Shimon Golan, *War on Three Fronts: Decision-making in the High Command in the Six-Day War,* (Tel Aviv: Ma'arachot), 84-85. (HEBREW)

[39] Interview with Meir Finkel, April 12 2018;

[40] IDF J3-TRADOC, Dado Center, *Design- Learning Processes and Knowledge Development for Developing Concepts in the General Staff and in the Major HQs,* (2015). (Hebrew)

3. 3   Distribution and Storage

While the acquisition process flows from the bottom up, the results of the interpretation and design of a new concept then flow from the top down, from the regional command to the tactical units. These tactical units are supposed to carry out the changes in the operational concept.

The pace of this process is extremely important. Information from the field must be ordered, then flow to the regional command learning team; there it must be interpreted and presented to the commander; an updated operational concept must be designed; and it must be distributed to all the forces in the field. All this must happen within 3-4 days, in order to enable the bulk of the force to enter the fight with a relevant concept, while still providing enough time for a sufficiently robust learning process. [41]

The storage phase is done at the level of the regional command. The same information gathered from the field and interpreted will be used in the other learning processes, including those that take place after the war. Part of the post-war learning process must be a study of the learning process in general, and of the learning process from the opening battles.

3. 4   Intelligence

In studying learning operations from opening battles, questions around intelligence arise. Is there a different type of intelligence needed to examine our operational concept? Are there particular types of knowledge that contribute to our ability to assess the relevance of our concept?

There are a number of ways the adversary's operational concept is expressed, some of which the acquisition and learning teams can find before the campaign, and others which only arise during the fighting:

1. *Written material about the operational concept, the operational plan, and doctrine* – These documents, gathered by intelligence or captured during previous operations, provide a clear, ordered insight into what the adversary wants to do and how he intends to achieve it. Once the campaign begins, more documents may be captured, and enemy prisoners can also provide important information.[42]

2. *Assessment of battle arrays with a focus on defense vs. offense* – This can also be initially assessed before the campaign, then tested during the fight. Is the defensive array based on fixed positions or a flexible defense? Are more capable forces positioned at the front lines, or are they behind lines of lower quality troops? The pre-war assessments can be tested against what the brigades are experiencing in the field.

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[41] Telephone interview with LTC (res.) Dr. Gilad Arieli, April 3, 2018.

[42] Interview with COL Udi Zechariah, April 18, 2018.

3. *Appearance of new weapons or new uses of existing weapons* – Contact with the enemy in learning operations is meant to entice them to use their weapons according to their current doctrine and display key capabilities and techniques against us. It is not only the existence of the capability that is important, but also the way it is used and the rationale behind its use. Isolated use of a capability can't tell us enough about the enemy's operational concept. But with three brigades in the fight, there is enough friction to generate insights into enemy approaches to the use of those capabilities and to provide indications of their operational concept.[43] In the 1973 case, Israel was well-aware of Egyptian anti-tank missiles, but was surprised by the way they were used, which should have indicated that the enemy concept was not what Israeli intelligence anticipated.[44] Learning and acquisition teams at the brigade level should particularly look for these unanticipated uses of capabilities that can speak volumes about enemy intentions in the campaign.

While in the past the Israeli concept was rapid maneuver toward rocket launch sites, now Israel's concept needs to place an emphasis on defense as well.[45] The first concept directed learning cells to search for launch sites and "nature reserves", while now learning teams must focus on raiding forces and associated special weaponry- like drones or light vehicles – or even armored vehicles.[46]

3. 5   Training

The force design element of the teams involved in acquiring and interpreting information from learning operations is critical to success. In peacetime, they must be trained and must exercise their learning process. Training should include the C2 elements involved in the entire process. The acquisition/interpretation teams with the brigades should exercise gathering relevant information from tactical learning teams and from junior commanders; they should experience passing information to the operational concept learning team at the regional command/corps; and the division commander should practice gathering his own insights on the relevance of our concept and passing it to the regional command.

The acquisition/interpretation teams should also exercise identifying changes with operational-level implications among the enemy. These exercises, which can be done virtually or during major field exercises, would involve analyzing the enemy's operational concept, then teasing out its basic assumptions. The team would have to decide what

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[43] *Ibid;* Interview with MG Turjeman, April 25, 2018.

[44] Finkel, *On Flexibility,* 200-201.

[45] Alon Ben-David, "Decision against Hezbollah will be achieved not only through attack, but also through effective defense," *Mariv,* September 9, 2017.

[46] Or Heller, "The Preparation for the Third Lebanon War," *IsraelDefence*, July 21, 2016.

would indicate a significant change, including use of fires, method of defense, use of technology and weapons, force deployment in the field, use of special forces, and more.

The senior commanders, especially the commander of the regional command/corps, must also experience the pressure of discovering early on in a campaign that the operational concept he worked hard to develop is not relevant. After overcoming this significant psychological obstacle, he must lead the process of rapidly developing a new concept based on the brigade-level and command-level learning teams. "We must try to cause the senior commanders to 'fail' in training," emphasized MG Turjeman, "and cause them to operate while we drop in unanticipated events all the time, that have to do with concepts that it turns out are not appropriate."[47]

These two steps in training – breaking the psychological barrier and developing a new concept under fire – cannot fully reproduce the difficulty that they will face during a campaign, but it will give senior commanders a chance to experience some element of the pressure of admitting the concept is irrelevant and creating a new one under duress.[48]

It is important to train the fighting units in several possible concepts. Even more crucially, they must be experienced in changing operational plans during a campaign as a result of a new operational concept. Training must seek to create a "master key" that can solve a range of challenges, not a highly specialized force trained to carry out one concept that may well change.[49]

3. 6   Learning Operations in other Services

Though this study focuses on the Ground Forces, the idea applies to other services as well. The IAF- and other air forces- face a challenge in dealing with surprises at the outset of campaigns. The very characteristics that guide their organizational culture and their planning processes – professionalism, striving for perfection, precise planning to the smallest details – can also render them stiff and clumsy in the face of surprises.

An example of the IAF rigidity is its template for order of importance of missions, which developed over decades – gaining aerial superiority, strategic reconnaissance, strategic bombing, support for ground forces, and support for naval forces. This has expressed itself in phases that haven't changed since 1967 – an opening operation, attacking strategic targets and infrastructure and protecting Israel's skies, and support for ground forces. The massive opening strike has become a cornerstone of IAF campaigns whether it is actually productive or not.[50]

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[47] Interview with Turjeman, April 25, 2018.

[48] Finkel, *On Flexibility,* 135-147.

[49] Interview with Hecht, April 2, 2018.

[50] Alon Kadish, "Not by the Air Force Alone – The IAF and IDF in the Six-Day War," *The Dado Center Journal 11-12,* (Dado Center, 2017) 27, 33; and Ephraim Segoli and Rafi Rudnick, "Operation Focus – Conceptual Anchor or Weight," *The Dado Center Journal* (Dado Center, 2017), 111-128. (Hebrew)

With its rigid pattern, chances are high that the IAF will face a surprise that calls its core assumptions into question. In order to protect itself against surprises, the IAF should consider learning sorties. These flights would be designed to reveal enemy air defense concepts and capabilities, using a small number of jets to rouse the enemy into action. This information will provide useful friction for learning on both the tactical and operational levels. After this rapid learning process, future reconnaissance and strike operations will be better designed to deal with enemy air defenses. Of course, adopting this approach will mean the IAF will have to give up its belief in massive strikes at the beginning of all campaigns, and will have to discern when learning sorties are the better option.[51]

3. 7   Tensions and Limitations

No matter how well learning operations are carried out, there will be tensions that can never be fully resolved. Still, they should be expressed outright so that commanders and thinkers will anticipate them and prepare accordingly.

The learning process described here is only relevant if done rapidly, within days. This will allow the major part of the force to enter with a relevant operational concept. But learning takes time, especially in combat, with new information pouring in constantly. The tension between the pace and the completeness of the learning process will always remain, but the commander must not get bogged down in the desire to continue to check and confirm his findings. The process cannot continue indefinitely. The improved operational concept must reach the troops in the field in a timely fashion in order for it to have any value at all.

Commanders will naturally be focused on the fight. The learning teams at both the brigade and regional command levels will find it a challenge to take time and attention for the purpose of learning away from officers about to lead troops into combat. Some will not understand the importance of learning during combat, and more will not grasp learning operations at the beginning of campaigns. Still, the learning teams must develop personal connections and trust with the relevant officers ahead of time, and must consist of individuals with the experience and reputation to get the attention of the commanders that can help them learn.

During the short period in which the learning operations are underway, the enemy will have time to prepare himself in sectors where the brigades are not operating. This is not ideal. But given the pattern of IDF operations in recent decades, with a period of opening airstrikes and a call-up of reserves, Israel's enemies generally have not been surprised by the major land incursion in any case.

There is also the potential that the enemy will learn from us as much as we learn about him in the opening days.[52] As long as the commanders from brigade to command/

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[51] Finkel, "Learning Operations", 19.

[52] Interview with Eado Hecht, April 2, 2018.

corps are aware of this potential, and invest effort in hiding new capabilities and concepts from the enemy during the learning operations, this issue is manageable.

Ethical concerns will be voiced about sending troops into harm's way for learning, not for achieving a battlefield decision over the enemy. However, the brigades in the fight are indeed working toward tangible tactical and operational goals. It is the teams attached to them that use the friction caused by these units in order to learn. In addition, soldiers have long risked their lives for intelligence and information. These learning operations will be an important element in testing existing intelligence estimates, and will provide insights that will save lives for the rest of the campaign. That is certainly a goal worth soldiers risking bodily harm.

MG Turjeman points to three limitations to learning operations. First, the campaign has to be our initiative, so we can control the timing and pace of escalation at the outset. Israel was attacked in 1973, and had no time for learning operations on the collapsing Syrian front.[53] Second, operations done in stages have the potential to cause more harm than good, since they give the enemy a chance to learn as well, and removes the possibility of surprise. And finally, there are circumstances in which one prefers to carry out a quick operation because of internal and/or international pressures, and cannot spare the days of learning at the outset.[54] Indeed, learning operations are not advantageous or even possible for all conflicts at all times, but can be an extremely effective tool in the right circumstances.

Commanders in the learning process should be aware of the above tensions, and anticipate ahead of time how they intend to cope with them. This will keep them from harming the learning process when they arise.

4   CONCLUSION AND IMPLICATIONS

This wartime learning competition takes place amid the fog of war. Militaries will continue to arrive to battle with pieces of the puzzle missing, with an unclear picture of the enemy and of their own capabilities. Surprise will be an ever-present feature of future warfare.

This study aimed to address that challenge by offering a framework for learning operations at the outset of campaigns, when there is an opportunity to concentrate the learning effort and rapidly adapt the relevance of one's operational concept. The work recognizes the importance of friction in learning and experiencing the enemy's concept in action. Only by learning though action can we fully examine the relevance of our concepts.

The authors proposed the initiation of direct contact with the enemy at the start of hostilities, using three brigades – the size of one division – which will have acquisition and initial interpretation teams attached to them. At the regional command/corps level,

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[53] *Ibid.*

[54] Interview with MG Turjeman, April 25, 2018.

operational concept learning teams will support the corps commander as he uses the information from the learning operations to determine the nature of the relevancy gap in his operational concept, and what needs to be changed in the new concept in order to minimize this gap.

Change in large organizations takes time. Resistance to new ideas is a recurring problem in militaries, even if they pay lip-service to the importance of innovation. It is quite conceivable that the idea of learning operations will also stir up resistance. Some will point at the difficulty in testing an operational concept from the fighting experience of just three brigades, the distraction from direct decisive operations, the loss of surprise, the lack of concentrating effort, and the waste of resources and men for an ostensibly less important mission like learning and adaptation.

This work has offered answers to each of these criticisms. Our understanding of the enemy's concept come from a range of processes and sources, including classic intelligence, which is augmented by learning operations. Decisive victory on the battlefield is not a zero-sum game with learning, since the acquisition and interpretation teams are attached to brigades fighting the enemy, who are trying to defeat the enemy in front of them. And there is no wasting of resources, since the brigades are not suffering casualties only to learn. Instead, there is a synergy between learning and fighting.

The two final claims – the lack of concentrating effort and the loss of surprise – are the most challenging.

Still, the use of three brigades, fighting as one division or separately, for several days, does not significantly harm the idea of concentrating force, especially when looking at the war as a whole.

As for the loss of surprise, this is nothing new for ground forces. Israel often opens with a massive opening airstrike, as it did in Operation Cast Lead and Operation Pillar of Defense, which robs the ground forces of the possibility of tactical surprise anyway. In other campaigns, like Operation Protective Edge or the Second Lebanon War, the opening stages did not include any tactical or operational surprise from ground forces. There is a time period in recent Israeli operations – which is also related to Israel's political process- before the massive ground incursion, when there is no possibility of surprise, that can be used for learning operations. Moreover, Israel depends on its reserves for major operations, which take 48-72 hours to call-up, equip, and deploy on a massive scale. This is the perfect window for learning operations.

Despite the substantive objections to learning operations at the beginning of campaigns, the benefits far outweigh the costs. It protects the preponderance of the force from paying the cost of fighting with a flawed concept, and gives the conventional force an advantage in the learning competition, and thus in the fight itself.

The advantages of learning operations are not the exclusive domain of the ground forces. The IAF, with its rigid operational template and expectation that its new technology will solve the problems of the previous war, is susceptible to surprise at the beginning of wars. Other air forces suffer from a similar vulnerability. Adopting this same approach will enable them to learn about the enemy's capabilities and concepts and thus minimize the surprise it faces.

Throughout a campaign, we must assess where we are in relation to the goals we defined at the outset. Are we meeting our goals? Are we carrying out our missions? Are

we capturing territory? What is the rate of advance? What is our casualty rate, and what is the enemy's? An honest answer will give a clearer chart of the relevance of our operational concept. Defining clear and measurable goals, and assessing them throughout the fight, will allow us to know whether we must design a new operational concept.[55]

Learning operations at the beginning of campaigns offer an affordable solution that fits in with current learning procedures. The idea has the potential to create a major advantage for conventional militaries in the crucial learning competition. It offers an opportunity to improve those imperfect instruments with which we go to war, and that can both save the lives of our soldiers and provide an edge in the ongoing fight against highly adaptive enemies.

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[55] Interview with Turjeman, April 25, 2018.