



Students at the U.S. Army Command and General Staff College use a landpower map and rubber ducks to show proper employment of an armored brigade combat team on 10 December 2024 at Fort Leavenworth, Kansas. (Photo by Maj. Victor Pereira, Brazilian Army)

# From Research to Reality

## Cultivating VUCA-Resistant Thinking at CGSC

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*Creativity allows freer and bigger thinking even when resources are constrained. The simple ability to solve new problems in new ways and in some cases with old things affords a level of creative freedom across our force. The anchor of holding*

*onto the old while trying to create the new simply won't work. Conversely, if we find ourselves in need but don't have, a lack of creativity can be the first place we may want to look.*

—Lt. Gen. Milford Beagle



**Figure 1. Ukrainian Innovation**

Critical and creative thinking must be linked in the minds of leaders. They must have the creative imagination to conceive new ways to solve problems and the critical thinking to turn innovative ideas into practice. Military leaders must be able to do this under volatile, uncertain, complex, and ambiguous (VUCA) conditions.

To find an affordable and feasible solution to shooting down drones, the Ukrainian military sourced 20 mm Zastava M55 antiaircraft cannons produced under license by the former Yugoslavia that were based on the World War II Hispano-Suiza HS.804 antiaircraft auto cannon.<sup>1</sup> To improve the cannons' accuracy, the Ukrainian military installed two CCTV cameras that were made in China and enabled them with a consumer tablet mounted on a flexible arm stand made by a Dallas-based company (see figure 1).<sup>2</sup> This creative solution armed the Ukrainian military with an affordable and effective automatic weapon system for shooting down drones. It is an example of "solving new problems in new ways ... with old things" and is only one example from the Russia-Ukraine War where the combination of critical and creative thinking resulted in innovation.<sup>3</sup>

The above example highlights the need for critical and creative thinking to drive change and meet the battlefield surprises and challenges presented in a VUCA environment. Facing an operational environment where the rate and scope of change is increasing exponentially, the call for field grade leaders who are experts at combining critical and creative thinking

is increasing in volume.<sup>4</sup> Leaders at the U.S. Army Command and General Staff College (CGSC) have heeded this call and initiated teaching innovations in critical and creative thinking curriculum using a research-focused, outcomes-based approach. By integrating divergent and convergent thinking with narrative cognition, the aim is to refine and apply this curriculum for use in future classrooms.<sup>5</sup> The new critical and creative thinking module, C150: Critical and Creative Thinking, is the latest outcomes-based approach to build VUCA-resistant critical and creative thinking at CGSC. VUCA-resistant thinking is critical for our leaders because it will make them flexible and adaptive to anything the enemy throws at them. C150 achieves this by building perspective taking skills, the ability to recognize plot twists during operations, and manage resilient thinking despite the chaos of war.

In previous years, CGSC had six hours of critical and creative thinking in its curriculum, a four-hour critical thinking class and a two-hour creative thinking class. During academic year 2023, a creativity study was conducted experimenting with narrative cognition.<sup>6</sup> A two-hour experimental lesson was administered to a test group that showed an increase in creativity over the control equivalent to a standard deviation.<sup>7</sup> In May 2024, Lt. Gen. Milford Beagle directed that six new hours of creative thinking be introduced, applying the lessons learned during the creativity study. These new hours of instruction emphasized building on the creative narrative cognition-based approach employed during the creativity

study that yielded improved creativity. This new lesson block, C150: Critical and Creative Thinking, contained a total of twelve hours (four critical and eight creative thinking). The organization of this lesson block is listed as follows:

- **C151: Critical Thinking (four hours).** This lesson teaches students about critical thinking frameworks, cognitive biases, fallacies, and how critical thinking can be improved with practice.
- **C152A: Creative Thinking Through Divergent and Convergent Thinking (two hours).** This lesson teaches students that creative thinking is an innate human quality that can be improved, organizational leaders can foster creativity, and leaders can remove barriers to creative thinking.
- **C152B: Creative Thinking and Narrative Cognition (two hours).** This lesson teaches students how to use counterfactual and causal thinking through perspective plotting and plot twisting to demonstrate creativity. Counterfactual thinking allows students to explore “what if” scenarios, fostering creative solutions by reimagining past events or decisions. Causal thinking helps students understand the connections between actions and outcomes, enabling them to plot new strategies and “twist” perspectives to solve problems in innovative ways.
- **C153A: Unmasking Leadership Failures Through Narrative Practice (two hours).** This lesson teaches students how to manage anger and fear while thinking creatively in VUCA environments.
- **C153B: Recognizing Exceptional Information Through Narrative Practice (two**

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**hours).** This lesson teaches students to hone their cognitive sensitivity to recognize emerging threats and opportunities so that they can help their leaders to address surprises in the operational environment faster than their opponents.<sup>8</sup>

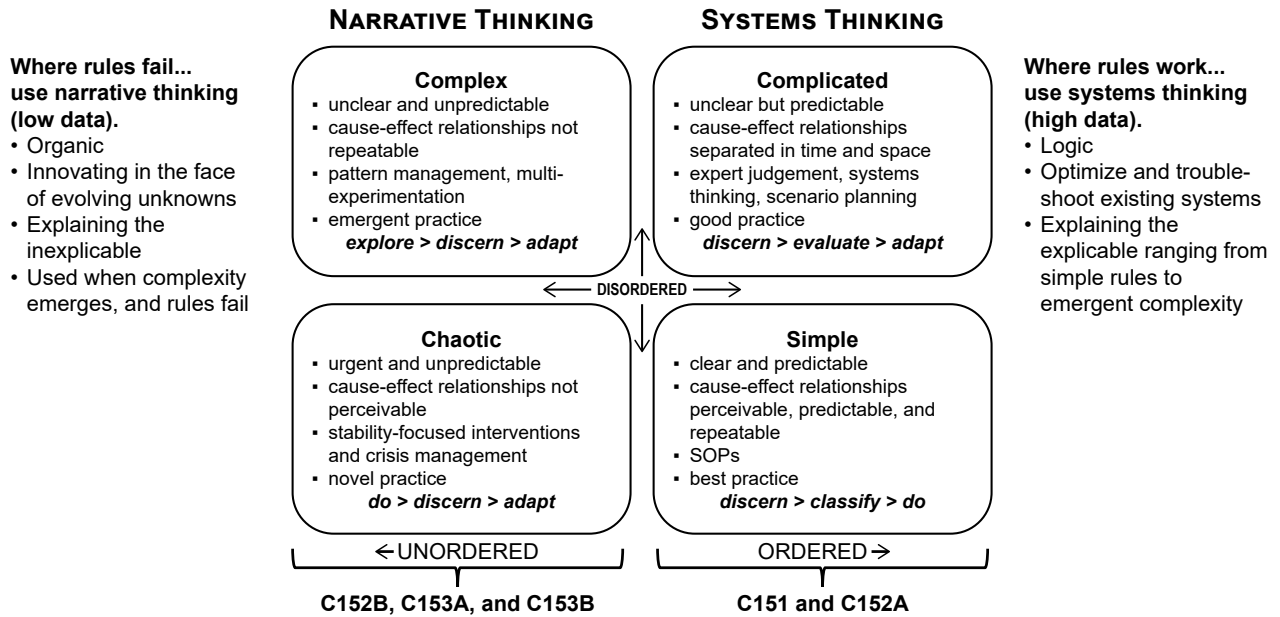
The teaching faculty implemented the new lessons this year by rapidly learning six new hours of instruction using a novel approach to teaching. Their feedback, along with student feedback, will shape refinements to improve outcomes for next year. This approach is a continuation of the ongoing research into critical and creative thinking at CGSC driving intellectual change as the program evaluation for C150 will be published in March 2025. As these lessons are refined, the concepts and practices will be threaded into the curriculum writ large to allow students opportunities to develop and hone their critical and creative skills. These lessons introduce a new

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## Systems Thinking, Narrative Cognition, and the Cynefin Framework



(Figure adapted from C. F. Kurtz and D. J. Snowden, "The New Dynamics of Strategy: Sense-Making in a Complex and Complicated World," *IBM Systems Journal* 42, no. 3 [2003], <https://doi.org/10.1147/sj.423.0462>; and the Cynefin Framework, <https://cynefin.io/wiki/Cynefin>)

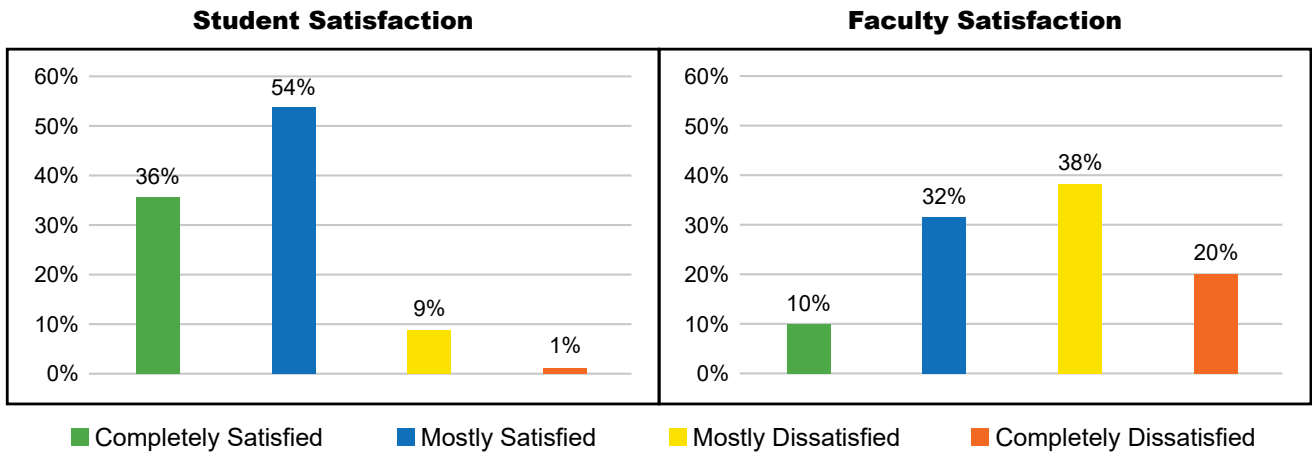
### Figure 2. Cynefin Model

way of looking at the thinking that underpins combined critical and creative thinking using the Cynefin framework, which is a sense making model that helps leaders understand levels of disorder in an environment (see figure 2).<sup>9</sup>

The overall effect of the new curriculum is still under examination. Surveys and sensing sessions conducted after completion revealed that students generally expressed satisfaction with the new curriculum, with responses ranging from mostly satisfied to completely satisfied. The faculty charged with conducting the new curriculum reported a contrasting experience with most indicating dissatisfaction to complete dissatisfaction (see figure 3). While the causes of his disparity are not entirely clear, they may stem from the expedited timeline to develop the curriculum, which left faculty with less preparation time than usual before implementation. Additionally, adding six hours of new content to courseware that remained largely unchanged for several years may have generated some of this dissatisfaction.

The amount of disorder in the environment (such as combat) dictates what kind of thinking one should

employ. In high data environments where problems respond to rules, logic, systems thinking, and explaining the explicable, divergent/convergent thinking works. When the environmental disorder transitions into complexity and chaos, thinking must be more organic and seek to explain the exceptional using narrative cognition. These lessons start at the known and knowable in critical and creative thinking using divergent/convergent thinking (C151 and C152A) and progress into complexity and chaos using narrative cognition (C152B, C153A, and C153B). For example, logic and systems-thinking approaches during planning combine critical and creative thinking employed in the military decision-making process and the joint planning process (C151 and C152B). In contrast, narrative imagination and creative adaptation during operations combine critical and creative thinking during the rapid decision-making synchronization process and contingency planning under a time constraint. Field grade leaders need all these skills to succeed in the variety of environments in which they must operate because VUCA reigns in combat, especially in our current environment of rapid changes that often constitute large and



(Figure adapted from the U.S. Army Command and General Staff College QAO post-instruction survey data)

**Figure 3. Student and Faculty Satisfaction**

unexpected shifts. News headlines provide frequent instances of how critical and creative thinking can innovatively disrupt expected outcomes. As described at the beginning of this article, the war between Russia and Ukraine provides us with some prime examples.

A smaller, more innovative and adaptive force is punching above its weight against a larger force that appears at times to be less creative. There is an unprecedented example of this kind of thinking by Ukrainians, its operations in the Black Sea. Ukraine, a country without a navy, appears to have forced Russia, a country with a navy, out of the Black Sea. Ukraine accomplished this feat using a combination of critical and creative thinking applied to emerging technologies. Ukrainians employed uncrewed surface vessel 3D-printed boats as one example.<sup>10</sup> Using off the shelf technology applied in novel ways, these remotely piloted vessels were unique and VUCA inflicting. This credibly adaptive and innovative approach has clearly surprised Russia and aided the Ukrainians in

accomplishing operational and strategic effects. It is this type of critical and creative thinking that has helped Ukraine use its resources in novel ways to maintain parity against a larger, better equipped adversary.

The example of Ukraine’s innovative use of old technology combined with new solutions highlights the importance of integrating critical and creative thinking in military operations. As the operational environment becomes more complex and unpredictable, leaders must possess the ability to adapt quickly and think outside conventional boundaries. The C150: Critical and Creative Thinking curriculum demonstrates a forward-looking approach to developing these essential skills through drills that build critical and creative thinking blending capabilities. By fostering an environment where critical and creative thinking are used together to solve problems, the CGSC prepares leaders to navigate VUCA environments effectively, ensuring they are equipped to meet the challenges of tomorrow’s conflicts.<sup>11</sup> ■

## Notes

**Epigraph.** Milford Beagle, “Disruption Is the Key to Delivering the Army of 20XX,” *Military Review* Online Exclusive, 13 February 2024, <https://www.armyupress.army.mil/journals/military-review/online-exclusive/2024-ole/disruption-is-the-key/>.

1. Sebastien Roblin, “To Stop Killer Drones, Ukraine Upgrades Ancient Flak Guns with Consumer Cameras and Tablets,” *Forbes*,

11 December 2022, <https://www.forbes.com/sites/sebastien-roblin/2022/12/11/to-stop-killer-drones-ukraine-upgrades-ancient-flak-guns-with-consumer-cameras-and-tablets/>.

2. Ibid.

3. Beagle, “Disruption Is the Key to Delivering the Army of 20XX.”

4. Richard McConnell and Angus Fletcher, “Creativity: The ‘Backbone’ of Initiative,” *NCO Journal*, 17 April 2023, <https://www.ncojournal.com/creativity-the-backbone-of-initiative/>.

[armypress.army.mil/Journals/NCO-Journal/Archives/2023/April/Creativity/](https://armypress.army.mil/Journals/NCO-Journal/Archives/2023/April/Creativity/).

5. For details about how narrative cognition works for C150 Critical and Creative Thinking, refer to the C152B slides and videos that follow. For slides, see "C152B: Creative Thinking and Narrative Cognition" (PowerPoint presentation, Fort Leavenworth, KS: Command and General Staff College [CGSC], August 2024), [https://cgsc.blackboard.com/bbcswebdav/xid-32196253\\_1](https://cgsc.blackboard.com/bbcswebdav/xid-32196253_1); "C152B: Alternate CE (John Bramblett Art)" (PowerPoint presentation, Fort Leavenworth, KS: CGSC, August 2024), [https://cgsc.blackboard.com/bbcswebdav/xid-32196301\\_1](https://cgsc.blackboard.com/bbcswebdav/xid-32196301_1); "C153A: Unmasking Leadership Failures Through Narrative Practice" (PowerPoint presentation, Fort Leavenworth, KS: CGSC, August 2024), [https://cgsc.blackboard.com/bbcswebdav/xid-32196410\\_1](https://cgsc.blackboard.com/bbcswebdav/xid-32196410_1); "C153B: Recognizing Exceptional Information Through Narrative Practice" (PowerPoint presentation, Fort Leavenworth, KS: CGSC, August 2024), [https://cgsc.blackboard.com/bbcswebdav/xid-32195796\\_1](https://cgsc.blackboard.com/bbcswebdav/xid-32195796_1). For videos, see *C152B Creative Thinking and Narrative Cognition*, posted 12 September 2024 by "USArmyCGSC," YouTube, 1:20:20, <https://www.youtube.com/watch?v=MsaduoRryLM>; *C153A Unmasking Leadership Failures Through Narrative Practice*, posted 12 September 2024 by "USArmyCGSC," YouTube, 1:13:47, <https://www.youtube.com/watch?v=bikXa9gq8fA>; *C153B Identifying Exceptional Information Through Narrative Practice*, posted 12 September 2024 by "USArmyCGSC," YouTube, 1:19:14, [https://www.youtube.com/watch?v=NmSeZKChl\\_w](https://www.youtube.com/watch?v=NmSeZKChl_w). At 55:37 in C153B, Lt. Gen. Milford Beagle speaks about the C150 initiative.

6. Angus Fletcher, *Storythinking: The New Science of Narrative Intelligence* (New York: Columbia University Press, June 2023), 33. Narrative cognition is thinking in actions (as opposed to thinking in equations, like algorithms do). It includes counterfactual and causal thinking and is how the brain sequences actions into plots, plans, and strategies.

7. Richard McConnell et al., "Improving Creative Thinking Through Narrative Practice," *Developments in Business Simulation and Experiential Learning: Proceedings of the Annual ABSEL*

*Conference 50* (2023), <https://absel-ojs-ttu.tdl.org/absel/article/view/3383/3323>; McConnell and Fletcher, "Creativity."

8. Field Manual 5-0, *Planning and Orders Production* (Washington, DC: U.S. Government Publishing Office, November 2024), para. 6-17. Staff members are particularly alert for answers to commander's critical information requirements (CCIR) that support anticipated decisions. They also watch for exceptional information—information that would have answered one of the CCIRs if the requirement for it had been foreseen and stated as one of the CCIRs. Exceptional information usually reveals the need for an adjustment decision (triggers the rapid decision-making and synchronization process). Narrative practice is a process where a team of two people are provided a prompt and explain how they would solve the problem to their teammate. After a second prompt, teammates role-play their partners, attempting to assume their partner's perspective. Teammates pose questions and give feedback on how to improve their teammate's perspective. For more detail about narrative practice, see the creativity research report McConnell et al., "Improving Creative Thinking through Narrative Practice."

9. C. F. Kurtz and D. J. Snowden, "The New Dynamics of Strategy: Sense-Making in a Complex and Complicated World," *IBM Systems Journal* 42, no. 3 (2003): 462–83, <https://doi.org/10.1147/sj.423.0462>.

10. Laura Heckmann, "Just In: Ukraine's Robotic Boat, Drone Tactics Carries Lessons for U.S.," *National Defense*, 5 March 2024, <https://www.nationaldefensemagazine.org/articles/2024/3/5/just-in-ukraines-employment-of-uncrewed-vessels-carry-lessons-for-us>.

11. For more details on systems and narrative thinking, see Rich McConnell, "Systems and Narrative Thinking: The Complementary Thinking Styles for Simple to Chaotic Situations," *Project Management International* (forthcoming). For more information on narrative cognition/story thinking, see Tom Gaines, "Stories That Win Wars: The Role of Narrative in Military Planning and Innovation," *From the Green Notebook*, 2 December 2024, <https://fromthegreennotebook.com/2024/12/02/stories-that-win-wars-the-role-of-narrative-in-military-planning-and-innovation/>.