ACHIEVING COGNITIVE OVERMATCH THROUGH HUMAN-AI TEAMING:

HOW AI SUPPORTED FEEDBACK ENHANCES STUDENT-CENTRIC RESULTS & EMPOWERS INSTRUCTORS

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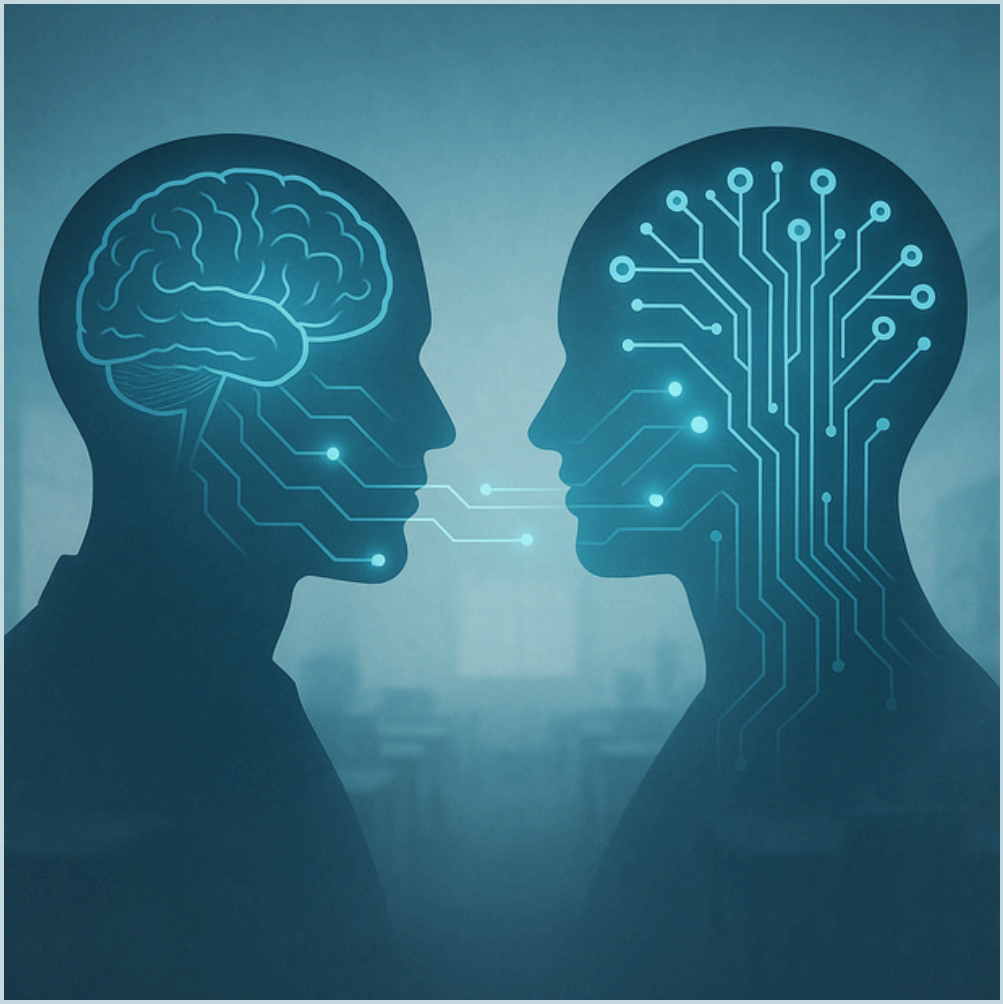
Editor's Note: This article reflects the authors' professional opinions and interpretations. It does not represent the official views, positions, or policies of the Field Artillery Commandant or Field Artillery School.



In the bustling corridors of military educational institutions,

faculty members often find themselves racing against time, juggling multiple responsibilities while striving to grade hundreds of papers each week. The sheer volume of work can overwhelm even the most dedicated instructors, leading to diminished feedback quality and mounting frustration. Then, the worst-case scenario occurred: a government shutdown abruptly removed civilian faculty from the equation. What could have become a crisis instead became a crucible for innovation. Uniformed educators rose to the challenge, not only maintaining throughput but increaseing it, while enhancing the quality of feedback, with fewer personnel.

This remarkable transformation underscores the power of emerging technologies in reshaping education. By leveraging human-artificial intelligence (AI) teaming and data-driven tools, military institutions are redefining instructional effectiveness, fostering deeper learning, and preparing leaders for the complexities of modern warfare.

The Challenge of Traditional Grading

Traditional grading is a labor-intensive process. Faculty spend countless hours reviewing assignments, providing feedback, and ensuring students receive the guidance they need. Yet, when overwhelmed by large volumes of work, instructors risk being bogged down in minutiae – grammar corrections formatting issues, and

repetitive rubric checks – rather than focusing on higher-order feedback such as creative and critical thinking and analytical skills.

The government shutdown highlighted these vulnerabilities. Faced with the sudden absence of civilian faculty, uniformed educators turned to innovative solutions that redefined assessment and feedback, laying the foundation for systemic educational transformation.

Harnessing AI: The Guided Analytical Recommended Feedback (GARF) System

The key innovation driving this success is the GARF system,. GARF represents a tangible application of cutting-edge AI technology to enhance the learning experience.

How GARF Works: GARF performs a guided analytical review of student papers by utilizing the entire block of curriculum materials, lesson plans, readings, rubrics, the student's paper, and a carefully crafted AI prompt.

Human-Machine Teaming: Importantly, GARF does not provide a grade. Instead, it exemplifies human--machine teamingby, offering an analysis of the student essay that highlights potential strengths and weaknesses. This allows graders to concentrate on meaningful, higher-order feedback rather than being slowed down by repetitive tasks..

Balanced Feedback: Instructors have the flexibility to incorporate as much or as little of the detailed personal feedback provided by GARF as they choose. This allows them to tailor the feedback to their teaching style while preserving their unique insights and expertise. By offering tailored recommendations, GARF enhances the grading process, ensuring it remains efficient and insightful while maintaining a balance between automated support, and the human touch.

By relieving graders from repetitive tasks and focusing their attention on substantive issues, GARF enables faculty to deliver feedback that is detailed, actionable, and aligned with rubric requirements – while maintaining consistency across instructors regardless of experience level.

Massive Throughput Increase

During testing within the Distance Education Department (DDE) over one month, GARF demonstrated a significant increase in grading efficiency. Combined, the courses L100 and H100 saw an overall increase of 57 percent in grading in grading throughput compared to the previous five-month average. Importantly, this outcome was achieved while operating under a significant manning shortage.

This improvement allowed military graders to reallocate their efforts toward other critical responsibilities, such as student interaction and curriculum development. The result was a more balanced and effective use of faculty expertise, reducing burnout while strengthening the profession.

A Systemic Breakthrough for Professional Military Education (PME)

The benefits of GARF extend far beyond the initial crisis:

- **Addressing Workload Burdens:** With more than 19,200 essays graded annually across distance and residence courses, GARF alleviates a substantial institutional burden.
- **Modernizing PME:** GARF aligns with the Army's imperative to modernize PME by integrating AI-supported analysis and data literacy into instructional processes.
- **Strengthening the Profession:** By freeing up instructor time, GARF enables faculty to focus on mentoring and fostering intellectual agility – critical skills for navigating complex operational environments.
- **Enhancing Consistency:** GARF reduces the risk of "angry grading" caused by burning, ensuring feedback is consistently high-quality and aligned with rubric standards.

This systemic improvement represents a shift away from outdated feedback methods toward a modernized, refined

process – one that is more efficient, transforms current methods, contributes to a better product, improves the student experience, accelerates grading and feedback timelines, empowers faculty, and reforms PME through the integration of technology.

Preparing Leaders of the Future

As the Army embraces emerging technologies, educational transformation is not simply about new tools; it is about rethinking the entire paradigm. In a world defined by volatility, uncertainty, complexity, and ambiguity (VUCA), military leaders must be equipped with the intelelctual agility necessary to solve complex problems and apply critical and creative thinking.

By integrating GARF into the feedback process, military institutions are preparing officers for an era of autonomous, algorithmic, and cybernetic warfare. The goal is not to replace human judgment but to refine assessment and decision-making through data-supported insight, ensuring true cognitive overmatch in the decision space.

Accelerating Faculty Development

GARF's impact extends beyond students; it is equally transformative for faculty. By consistently modeling what detailed, rubric-aligned, and constructive feedback looks like, GARF accelerates the professional growth of both inexperienced and seasoned instructors. New faculty quickly learn to recognize the hallmarks of high-quality commentary, reducing the steep learning curve that often accompanies grading at scale.

As one instructor observed, "GARF's ability to generate detailed and thorough feedback was highly valued," while another emphasized that "the tool was intuitive and straightforward, making the grading process smoother." These reflections highlight how GARF not only lightens the workload but also serves as a developmental scaffold, showing instructors how to balance precision with personalization.

In this way, GARF is more than a student-centric innovation—it is a faculty development tool that strengthens the profession of arms by cultivating instructors who are better equipped to mentor, guide, and inspire future leaders.

GARF is a force multiplier for both sides of the classroom: students receive timely, individualized, actionable feedback, and faculty – especially the newer ones – gain a living example of best practices in assessment.

Advancing Cognitive Overmatch

The story of uniformed faculty rising to the occasion during a government shutdown exemplifies the potential of educational transformation through emerging technologies. GARF demonstrates how AI can relieve instructors from repetitive tasks, highlight key strengths and weaknesses in student work, and provide tailored recommendations while preserving the human expertise that makes feedback meaningful.

By embracing innovation, fostering collaboration, maintaining a commitment to critical thinking, and prioritizing high-quality feedback, military educators can create a learning environment that meets today's demands while anticipating tomorrow's needs. In the face of adversity, the commitment to excellence in education remains unwavering, ensuring that military leaders are well-prepared for the challenges ahead.

Note: This article builds on earlier work by the U.S. Army Command and General Staff College Quality Assurance Office on the application of artificial intelligence to support educational quality and institutional effectiveness.

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