AT A GLANCE
WHAT IS IT?
STRATEGIC has utilized two training products: the Flexible Adaptive Sequencing for Training (FAST) testbed, and MASTERY, a Moodle-based plugin, to identify the most effective and efficient techniques to increase engagement, produce learning gains, and maximize efficiency for a variety of rote memorization tasks in Marine Corps classrooms.

HOW DOES IT WORK?
Using adaptive flashcard-based systems, students are presented with learning trials tailored to their performance. Software algorithms assess students’ responses to determine how flashcards and feedback are presented. A series of experiments conducted across multiple classes will provide evidence as to which AT techniques lead to biggest improvements in student performance, engagement, and training efficiency.

WHAT WILL IT ACCOMPLISH?
• Provide evidence-based research on the use of AT techniques to increase learning efficiency, performance, and engagement in real-world classes.
• Enhance classroom time for students and instructors by providing time to discuss more advanced topics.

POINT OF CONTACT:
ONR Code 34
Dr. Peter Squire
peter.n.squire.civ@us.navy.mil

ABOUT:
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CRITICAL NEED
One of the Commandant’s priorities is to modernize and transform United States Marine Corps (USMC) training with student-centered approaches for 21st century learning. However, few USMC schoolhouses are equipped with digital-age tools to meet this requirement. Adaptive training (AT), which is training that is tailored to an individual student’s strengths and weaknesses, has been demonstrated to lead to improved learning outcomes and efficiency in laboratory contexts, but more research is needed to apply this approach in real-world USMC classrooms to understand how and when AT systems should be implemented.

OBJECTIVE: Explore adaptive training techniques in the context of long-term study and retention cycles (i.e., across a whole course) to improve student engagement, learning outcomes, and training efficiency.

RESEARCH APPROACH & CURRENT PROGRESS
The goal of STRATEGIC is to apply student-centered science of learning techniques shown to improve learning outcomes in the laboratory to real-world USMC classrooms to meet 21st century learning goals. STRATEGIC extends previous work (Investigating Cross Domain Adaptive Training) that explored the generalizability of adaptive training algorithms across different content areas for rote learning. STRATEGIC expands upon this research to determine benefits of adaptive training during an entire USMC course, rather than one-day training experiences usually conducted in a laboratory setting. Partnering with USMC schoolhouses, such as MCCSSS and MCES, the team has completed a series of experiments that explore the use of different feedback methods, progress dashboards, and adaptation algorithms in order to increase student engagement and training efficiency. These studies have shown promising results linking several feedback methods and individual differences to increased usage of adaptive training systems. Utilizing modern adaptive training techniques like these offer opportunities to increase student learning outcomes (e.g., improved exam scores and course performance), maximize precious classroom time for teaching more complex topics (e.g., reduce lecture time for basic rote information), and decrease instructor workload (e.g., fewer exam failures and remediation). The STRATEGIC effort will support the MTOT FNC with evidence-based research/algorithms and content.

RESEARCH CHALLENGES & OPPORTUNITIES
• Examine the effects of feedback methods and progress dashboards in longitudinal settings to identify strategies that increase engagement and learning outcomes.
• Partnering with USMC schoolhouses provides a unique opportunity to determine return on investment of applying 21st century learning techniques in USMC classes.