

Enhancing Strategic Thinking in Army Leaders through Skill-Building Exercises

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ABSTRACT

The complexity and volatility of today's operating environments require that Army leaders have advanced cognitive skills. It is no longer sufficient for officers to be technically and tactically proficient (Gurney & Smotherman, 2009). As tactical, operational, and strategic environments become increasingly intertwined, the Army needs leaders who can develop a holistic understanding of multi-dimensional problems, visualize ways to shape potential future states, and anticipate second- and third-order effects of decisions and actions. Recent research conducted by Sackett, Karrasch, Weyhrauch, & Goldman (2016) found that more and different strategic thinking development is required. The research found that the Army's current education and training system provides limited opportunities for developing leaders to practice the skills that underpin strategic thinking and complex problem-solving. This paper describes research to test methods for improving current and emerging Army leaders' ability to think strategically by providing them with opportunities to practice advanced cognitive skills. Specifically, the paper describes the development and formative evaluation of four practical exercises – for use in operational and/or classroom settings – designed to build and reinforce cognitive and behavioral skills that underpin the ability to think strategically. These exercises give participants the opportunity to practice and receive feedback on skills including: systems/holistic thinking, synthesis, questioning and information-gathering, reflection, thinking in time, and strategic foresight. A preliminary evaluation of the exercises was conducted with two groups: a Brigade and Division of the 1st Infantry Division at Ft. Riley and faculty members in the University of Foreign Military and Cultural Studies. The evaluation elicited feedback on 1) the value of the exercises for developing skills associated with strategic thinking, 2) ease of use of the facilitator materials, and 3) suggestions for improving the exercises. Findings are being used to revise the exercise materials.

Key Words: Strategic thinking, advanced cognitive skills, skill-building exercises, Army leaders, complexity

ABOUT THE AUTHORS

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Angela Karrasch, Ph.D. is a research psychologist and Chief (GS15) for the U.S. Army Research Institute for Behavioral and Social Sciences. Dr. Karrasch's Ph.D. is in Social Psychology from Kansas State University. She has been a Department of the Army Civilian for 18 years. During that time, she has conducted and documented research on various dimensions of leadership, training, and leader development. Prior to working for ARI, she worked at the Center for Army Leadership (CAL), where she helped write leadership doctrine, conducted research to establish an empirical basis for policy decisions on an Army wide leader development program, and represented the Combined Arms Center for the Human Dimension. She received the Achievement Medal for Civilian Service for her work developing influence training for Military Advisors, a Certificate of Achievement for her research on Female Engagement Team training, a Commander's Award for developing a research program on operational design, and Official Commendations for various research projects in the realm of leader development. She has published in the areas of leader development, teambuilding, productive discourse, strategic thinking, interagency collaboration, design for complex problem solving, influence, and 360-degree assessment.

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Anna Sackett, Ph.D. Dr. Anna L. Sackett is currently a Senior Consultant at MDA Leadership Consulting. She earned her Ph.D. in Industrial/Organizational Psychology from SUNY Albany, focusing on goal setting and motivation. Dr. Sackett worked for the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) at Fort Leavenworth for five years until February 2017, researching strategic thinking, visualizing complex problems, and leadership for the Army. Prior to ARI, Dr. Sackett was part of the Testing Division at 3M where she created selection tests for new employees and organizational satisfaction surveys. She has consulted for Collective Brands, Inc. (Payless) at the corporate HQ in Topeka where she again conducted selection testing for job candidates and was involved in designing and managing several organizational surveys.

James K. Greer, Ph.D. is an educator, leader developer, and mentor with over 15 years of teaching experience in collegiate, adult education, and workforce development. He is a Retired Army Colonel with 30 years of experience leading organizations from 20 to 7000 personnel through training, organizational transformation and operations; to include three years leading organizations in combat. He's Vice President of a management consulting company with seven years of experience providing training and education and workforce development for strategic planning, complex problem solving and organizational development for the public and private sectors. Dr. Greer earned his B.S. from West Point, his M.S. of Educational Consulting at Long Island University, his M.S. in National Security at National War College, and his Ph.D. in Education at Walden University.

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THE OPERATIONAL CHALLENGE FACING THE ARMY

The U.S. Army is increasingly operating in environments in which complex problems abound. Conditions are highly dynamic, volatile, and ambiguous. Political, economic, diplomatic, military, and socio-cultural issues are interacting in unexpected ways and creating conditions of unparalleled complexity for our military leaders. In past eras of conventional force-on-force conflict – such as the Cold War and Operation Desert Storm – technical capability and combat power were the key differentiators. But as conflicts have become more asymmetrical and increasingly conducted in “the gray zone”¹ (ISAB, 2017) – mental strength and agility has become central to the Army’s global mission (Kay, 2016).

Many Army leaders have risen through the ranks due to tactical success and strong leadership skills; but when they find themselves in positions that require strategic thinking and managing complex problems, they believe they could be better prepared (Sackett, Karrasch, Weyhrauch, & Goldman, 2016). The Army culture has been a contributing factor here, as the organization has traditionally recognized and rewarded tactical success over strategic thinking and related advanced cognitive skills such as questioning, critical thinking, long-term and big-picture thinking, and reflection (Wolters, Grome, & Hinds, 2013; Sackett et al., 2016).

More recently, there has been growing recognition that Army leaders operating in complex, uncertain, and multifaceted environments need skills and competencies that go well beyond tactical expertise. To make sound decisions, Army leaders need advanced cognitive skills associated with strategic thinking ability. They need to be able to manage ambiguity, think critically, ask good questions, and think holistically about problems by recognizing connections and interdependencies. They need to anticipate “ripple effects” of decisions and actions and visualize potential future states so they can effectively deter threats and shape conditions in ways that align to U.S. interests. They also need to consistently reflect and learn from their decisions and experiences.

Research Objective

¹ The “gray zone” is used to describe conflict that falls below the threshold of conventional military conflict and open warfare (Brands, 2016). It is “ongoing, low-level, and undeclared” (Knefel, 2015). The nature of the conflict itself is ambiguous, as are the actors. Tactics used by actors to achieve gains in the gray zone are unconventional – e.g., cyberattacks, political propaganda or interference, deception, economic coercion or sabotage – and tend to be shrouded in a way that makes the responsible party difficult to identify.

Recent examination of select Army Programs of Instruction (POI) found that the Army excels in certain areas of education related to strategic thinking, but has limitations in other areas (Sackett et al, 2016). Specifically, the Army education system offers opportunities for development of conceptual knowledge, but limited opportunities for leaders to practice the skills associated with strategic thinking, or to get feedback on their skills and reflect.

The objective of the effort described here was to help strengthen advanced cognitive skills in the Army by developing and testing methods for improving Army leaders' ability to think strategically. The methods developed are intended to provide both current and emerging Army leaders with opportunities to practice skills needed for strategic thinking and complex problem solving—in a safe environment—before needing those skills in complex operational settings.

In this paper, we describe the methods used to develop and test a set of four skill-building exercises. We begin by describing the process for selecting the skills and developing the exercises themselves. We describe the exercises along with the skills addressed, the activities involved, and the materials created. We then describe the approach used to evaluate the exercises, along with the associated findings. We conclude with a discussion of ongoing improvements to the exercises and incorporation of the exercises into a website to support Army leaders in managing complex problems.

METHOD

The research team used a multi-method approach to develop and evaluate the skill-building exercises, including four core activities: (1) skill selection and analysis of literature, (2) review of archival data, (3) interviews with strategic thinking development subject-matter experts (SMEs), and (4) exercise development. The goal of the first three activities was to guide development of the practical exercises. Each of these activities is described next.

Selecting the skills to address

A key decision required early in the research was to select the set of advanced cognitive skills to address in the exercises. Business and academic literature on strategic thinking suffers from a lack of consistent definition of the construct. Yet there is considerable convergence on the set of characteristics, skills, or enablers that are central to effective strategic thinking and complex problem-solving. Thus, we used that set of skills as our starting point. Those skills or enablers are presented in Table 1.

Table 1. Candidate skills considered for exercises

<ul style="list-style-type: none"> • Reflective thinking (Sanders, 2013; Van Riper, 2013) • Openness to diverse perspectives (Cross, 2013; Wong & Gerras, 2013) • Hypothesis generation (Goldman, 2013; Clark, 2013; Cross, 2013) • Scanning, questioning, testing, and conceptualizing (Casey & Goldman, 2010) • Cognitive flexibility (Vance, 2013) • Creative thinking (Sanders, 2013) • Metacognition (Paparone, 2013; Schmidt, 2013) • An historical mind (Clark, 2013) • Ability to visualize (Owen, 2013) 	<ul style="list-style-type: none"> • Systems orientation (Cross, 2013; Wong & Gerras, 2013) • Synthesis (Van Riper, 2013; Wong & Gerras, 2013) • Comprehensive information-gathering (Sackett et al., 2016) • Learning (Sackett et al., 2016) • Critical thinking (Sackett et al., 2016) • Innovative thinking (Sackett et al., 2016) • Thinking in time (Sackett et al., 2016) • Systems thinking (Sackett et al., 2016) • Communication (Sackett et al., 2016) • Collaboration (Sackett et al., 2016) • Emotional Regulation (Sackett et al., 2016)
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Addressing the full set of skills was beyond the scope of the effort, so the team developed criteria to guide selection of a subset of the skills for further consideration. The criteria included, for example:

- The skill had been identified from previous research as a significant need in the Army or as an area where current Army exercises or training are not available.
- The skill is needed at multiple echelons.
- Existing literature suggests a developmental direction for the skill.

Literature Review

The research team explored literature in fields including business, cognitive psychology, organizational psychology, leadership, and adult learning. The goals of the literature review were:

- to capture definitions of the candidate skills;
- to confirm there was an existing empirical or theoretical link between the candidate skills and strategic thinking; and
- to identify approaches and techniques that have been used (or have been recommended) to develop and reinforce the candidate skills.

The literature review confirmed that most of the candidate skills under consideration were associated with strategic thinking in the empirical or theoretical literature. Another finding from the literature review was the lack of research studies focused on techniques for enhancing the ability to think strategically and/or for enhancing the requisite foundational skills. The developmental strategy that appeared most promising was informal education and experiential learning (Casey & Goldman, 2010; Goldman & Casey, 2010).

Archival data review

The team also reviewed archival interview data from Sackett et al.'s (2016) research on strategic thinking tasks, skills, and development. Key findings from the review included the following:

- The Army needs to start early in Soldiers' careers to cultivate advanced cognitive skills associated with strategic thinking and complex problem-solving.
- Complex problems associated with "working in the gray zone" require Army leaders to discard their standard decision-making processes and templates and generate new approaches appropriate for the dynamic and chaotic environment they face.
- Reflective thinking is often considered an individual activity, but it has considerable value for groups as well. In addition, reflective thinking tends to focus too narrowly on content (the "what"), and less on process (the "how") and premise (the "why"; Mezirow, 1990).

Exercise development took each of these findings into account. Specifically, the exercises developed in the current effort: (1) are applicable to soldiers at multiple echelons, (2) challenge learners to work in the zone of uncertainty and ambiguity, (3) combine individual and team-based activities, and (4) include opportunities for individual and group reflection, as well as reflection on content, process, and premise.

Interviews with subject matter experts (SMEs)

Throughout the effort, the research team also engaged in interviews and in-depth discussions with two subject-matter Experts (SMEs) in strategic thinking development. The primary goals of the interviews and discussions were to identify developmental methods for strategic thinking, identify strategies they have used to develop advanced cognitive skills, and elicit suggestions for how to approach the development of specific skills. The research team also obtained feedback and suggestions from the SMEs on several iterations of the exercises during their development.

Exercise Development

To develop the exercises, the team initially developed a set of high-level concepts for 11 different activities. The concepts served as a basis for a half-day work session with ARI research psychologists. The session was used to elicit feedback on the initial ideas, collaboratively build on the concepts, and down-select the exercises for further development.

Following the down-select, the research team moved forward with development of four exercises. Each exercise was designed to provide development and practice in one or two primary skills, while also facilitating development of secondary skills such as self-awareness, communication, and mental flexibility. In creating the exercises, the research team adhered to principles of adult learning (Kearsley, 2003; Knowles, 1984). Specifically, the exercises:

- are problem-centered and experiential, rather than didactic and/or content-oriented;
- offer opportunities for collaboration and interaction with other learners;
- have relevance to the learner's job/role;
- offer opportunities for repetition and deliberate practice;
- involve feedback from both peers and facilitators; and
- provide opportunities for individual and group reflection.

In addition, we developed the exercises to be rich and complex enough so that repetition would be worthwhile and allow participants to build skill and insight each time they engaged in the exercise. The four exercises, along with the skills addressed are presented in Table 2.

Table 2. Skill-building exercises

Exercise	Primary Skills Addressed	Description
<i>Reflecting on Experience</i>	Reflective thinking	Participants reflect on a recent experience, while asking themselves progressively deeper questions.
<i>Asking Powerful Questions</i>	Questioning, information gathering	Involves use of imagery. Participants practice asking questions about an image that represents a complex situation, and determine how they will seek answers to their questions.
<i>Telling a Story: An Exercise in Connecting the Dots</i>	Systems thinking, synthesis	Involves use of imagery. Participants identify connections across a set of seemingly unrelated images, integrating them into a coherent narrative.
<i>Envisioning Potential Futures</i>	Thinking in time, strategic foresight	Involves use of scenarios derived from current events and open-source information provided by the Council on Foreign Relations. Participants read a description of a complex situation, consider how it came to be, and anticipate how it may evolve into the future.

Three of the four exercises require a facilitator; *Reflecting on Experience* is the exception and can be conducted individually as self-development or in a group setting with a facilitator. The materials were built on the assumption that those using the exercises will be skilled instructors and facilitators who will use the exercise materials as a starting point, but will not rigidly adhere to them. Rather, the assumption is that skilled instructors and facilitators will bring their own knowledge and instructional skills to enhance and build upon the exercises and will tailor them to their context of use.

For each exercise, the research team created a set of materials for the facilitators and participants. Materials for facilitators include²: (1) background material that describes the organizational context for the exercises, and an overview of the four exercises; (2) read-ahead materials, including overviews of each exercise (e.g., purpose, learning objectives, activities, and requirements), a brief tutorial, facilitator tips, and a sample facilitator script; and (3) exercise materials including a 2-page facilitator job aid, supporting slides, sample scenarios and images for the relevant exercises.

Materials for participants include a 2-page overview of the exercise with information such as learning objectives and exercise tips, and a participant exercise aid with prompts, questions, and space for notes.

² Since the development and testing of these initial materials, the materials have been condensed and integrated into a website to support leaders in managing complex problems.

Intended Audience

The exercises were developed for use with Army leaders and future leaders at a wide range of levels and functions (e.g., senior NCOs, junior and field grade Officers). Most of the exercises contain suggestions for how the exercises can be scaled to accommodate participants at a range of levels of knowledge and experience.

Additional Features

To make the exercises as accessible and useful as possible, the exercises were developed with the characteristics of adaptability, varied contexts of use, and flexible implementation. With respect to adaptability, the facilitator guide provides starting points for facilitators, but facilitators can revise or adapt the questions and other exercise material (scenarios, images, etc.) as needed to support repetition and/or use with participants at varying educational levels.

With respect to context of use, the exercises were created for use in a variety of settings including: classroom settings, embedded within a course (e.g., Intermediate Level Education courses, Captain's Career Course, School of Advanced Military Studies, and UFMCS); in field settings, with field units; or individually, for self-development. For example, the exercises can be used by a unit Commander who wishes to provide skill-building opportunities for his/her troops, or by individuals and/or small groups who wish to develop and practice these skills.

Finally, with respect to implementation, the exercises can be conducted as single learning events or in combination as a set of related activities. Although the exercises were not specifically developed to build on one another, there is a natural sequence to them, which is reflected in the order of presentation in Table 2. We hypothesize that the first two exercises will provide scaffolding that enhances participant learning in the latter two exercises.

Exercise pilot testing and revisions

Following the developmental phase, each exercise underwent pilot testing with a small group of participants at ARI and/or Applied Research Associates (ARA) to assess exercise flow and sequencing and identify needed revisions. Following each pilot test, the research team debriefed with participants and discussed ways to improve the exercises. The team made several revisions to format, instructions, and facilitator materials before conducting the formative evaluation described next.

Formative Evaluation

The final phase of the research was to conduct a preliminary formative evaluation. The evaluation was intended to assess the following:

- perceived value of the exercises for building the skills of interest;
- ease of use of the exercise materials and facilitator guide; and
- suggestions for improving the exercises and associated materials.

The evaluations were conducted in two contexts, chosen to represent both educational and operational settings. The first evaluation was conducted with faculty members of the University of Foreign Military and Cultural Studies (i.e., Red Team) at Ft. Leavenworth. The second evaluation was conducted at Ft. Riley with Brigade and Division Staff of 1st Infantry Division (1st ID).

Thirty people participated in the evaluation. Participants included 12 active, retired, and civilian education and training specialists (faculty members) from the UFMCS (formerly known as Red Team University), and 18 Brigade and Division command staff members of the 1st Infantry Division stationed at Ft. Riley, KS.

At UFMCS, an ARI research psychologist facilitated the "Telling a Story" exercise and a retired Army COL facilitated the "Asking Powerful Questions" exercise. Two research psychologists observed and took notes. At Ft. Riley, all four exercises were conducted over a 2-day period, with facilitation conducted by ARI research psychologists and a retired Army COL. A total of eighteen people participated in "Reflecting on Experience," nine participated in "Asking Powerful Questions" and "Telling a Story," and fourteen participated in "Envisioning Potential Futures." After each exercise, the team conducted informal debrief sessions.

Some of the questions considered and noted by observers included:

- How long did the exercise take?
- What parts seemed to work well? What made them work well?
- In what places, if any, did the exercise seem awkward?
- Where, if at all, do facilitators/instructors seem to get stuck?
- Where, if at all, do participants seem confused, frustrated, or stuck?
- What should be added or removed from the exercise to improve it?
- What else could help improve the execution of this exercise?

Following each exercise, participants completed a questionnaire³ that included both 5-point Likert-type scale items and open-ended questions, such as: What was most challenging about this exercise? And How could this exercise be improved?

Individual ratings data were used to calculate composite scores for five subscales: (1) perceived value, (2) applicability, (3) challenge-level appropriateness, (4) appropriateness of target audience, (5) affective reactions. The UFMCS data also included items for an “ease of facilitation” subscale. Responses to open-ended questions were analyzed using thematic analysis.

RESULTS

The preliminary evaluation provided valuable insight into perceived value of the exercises, as well as several suggestions for improvement. The findings are presented separately for the two groups of evaluation participants.

UFMCS Faculty (Red Team)

The quantitative data indicate that the faculty had fairly positive views of the “Telling a Story” exercise, as indicated by mean ratings at or above the mid-point of the 5-point scale for each of the subscales (see Table 3).

**Table 3. Means and
for “Telling a Story”
UFMCS) (N = 12)**

Subscale	<i>M</i>	<i>SD</i>	Standard Deviations (conducted at
Perceived value	3.53	0.56	
Applicability	3.62	0.60	
Challenge appropriateness	3.83	0.61	
Target audience appropriateness	3.50	0.83	
Affective reaction	3.88	0.71	
Ease of facilitation	3.58	0.82	

Their open-ended responses revealed a number of potential learning benefits to the exercise, such as becoming more self-aware of one’s biases and perspectives, gaining practice in identifying connections and linkages within a system, gaining awareness of how one’s personal experience can be a source of bias, and recognizing the advantage of having access to multiple perspectives.

Participants also described several challenges and/or limitations of exercise, along with suggested areas for improvement. Some described discomfort with the level of ambiguity inherent in the exercise, as well as the lack of feedback on the accuracy of the narratives they constructed.

³ Due to time constraints, the questionnaire was not distributed to the UFMCS group that tested “Questioning to Deepen Learning.”

The research team used feedback from the UFMCS instructors to make several revisions to the exercises before conducting the evaluation at Fort Riley. For example, we revised instructions in the participant exercise aid and in the facilitator materials to clarify intent. We also added information about recent research in strategic thinking to provide context for the exercises.

Brigade and Division Command Staff (1st Infantry Division)

Findings from the Ft. Riley evaluation indicated that participants had positive impressions of the exercises on each of the evaluation dimensions (see Tables 4-7 for means and standard deviations for each subscale, for each of the four exercises). Mean ratings were above the mid-point of the 5-point scale employed in the questionnaire, for all four exercises, and standard deviations indicated considerable consistency across respondents. Ratings indicated that participants viewed each of the exercises as valuable, engaging, appropriate for the target audience, and appropriately challenging. Participants' ratings also indicated that they believed the skills addressed in the exercises are applicable to tasks and problems they will face in their current or future roles in the Army.

Relative to the other two exercises, ratings were slightly lower for "Reflecting on the Environment" and "Asking Powerful Questions." However, the means for each questionnaire subscale still indicated a generally positive perception of the exercises' value, applicability, challenge level and target audience appropriateness.

Table 4. Means and Standard Deviations: "Reflecting on the Environment" (N = 18)

Subscale	<i>M</i>	<i>SD</i>
Perceived value	3.87	0.50
Applicability	4.14	0.62
Challenge appropriateness	3.83	0.40
Target audience appropriateness	3.69	0.81
Affective reaction	4.04	0.52

Table 5. Means and Standard Deviations: "Questioning to Deepen Learning" (N = 9)

Subscale	<i>M</i>	<i>SD</i>
Perceived value	3.78	0.40
Applicability	4.36	0.54
Challenge appropriateness	4.78	0.33
Target audience appropriateness	4.78	0.36
Affective reaction	4.74	0.40

Table 6. Means and Standard Deviations: "Telling a Story" (N = 9)

Subscale	<i>M</i>	<i>SD</i>
Perceived value	4.46	0.57
Applicability	4.47	0.54
Challenge appropriateness	4.41	0.49
Target audience appropriateness	4.39	0.49
Affective reaction	4.74	0.40

Table 7. Means and Standard Deviations: "Envisioning Potential Futures" (N = 14)

Subscale	<i>M</i>	<i>SD</i>
Perceived value	4.21	0.57
Applicability	4.41	0.55
Challenge appropriateness	4.24	0.61
Target audience appropriateness	4.54	0.46
Affective reaction	4.24	0.65

Responses to the open-ended questions indicated that participants found the exercises interesting, engaging, appropriately challenging, and worthwhile. Participants noted several learning benefits for each exercise and suggested that the exercises are challenging enough to engage participants in multiple ways and at multiple levels. Similar to the UFMCS instructors, participants from the 4th ID also reported limitations and challenges for each of the exercises. Some challenges were related to the difficulty participants had stepping outside the Army's normal way of doing things and thinking differently. Others reflected organization or pacing of certain aspects of the exercises. For example, participants noted the ambiguity and lack of context in both the "Questioning to Deepen Learning" and "Envisioning Potential Futures" exercises as challenging.

With respect to the uniqueness vs. redundancy of the exercises, some participants indicated that the "Reflecting on the Environment" and "Questioning to Deepen Learning" exercises were similar to training they had received elsewhere. In contrast, in response to the "Envisioning Potential Futures" and "Telling a Story" exercises, most participants reported that they had not encountered an activity/exercise that focused on the topics in these exercises.

With respect to who could benefit from the exercises, participants' responses indicated that the exercises could benefit Soldiers and Army leaders at multiple levels and in multiple operational roles.

Evaluation participants offered several suggestions for improvement and the research team used those suggestions to determine revision priorities. One revision included creation of a 2-page job aid to support exercise facilitation. Other revisions involved indicating components of the exercise that could either be conducted outside of the classroom or be broken into smaller segments or to help manage time constraints. The team also included additional facilitator tips based on questions asked during the preliminary evaluation.

DISCUSSION

Enhancing strategic thinking and related cognitive skills in the Army has been identified as an important objective for preparing Army leaders to manage current and emerging challenges, anticipate change, and shape the global environment (Sackett et al., 2016). As noted by Kay (2016, para. 11), "The officers who will be most adept at addressing gray zone competitions will do so because their minds are fit and they are made versatile through multi-disciplinary education." However, recent evidence suggests that Army personnel feel under-prepared to think strategically and manage the complex problems they face while operating in the "gray zone."

Creation and preliminary evaluation of four skills-building exercises suggest that the exercises show promise for helping to strengthen the Army's strategic thinking capability, particularly given that the design incorporates other important approaches to leader development, such as feedback and reflection (Conger, 1992). Using these exercises early in Soldiers' careers can help to cultivate advanced cognitive skills and strategic thinking ability among emerging Army leaders. Yet ongoing improvements and evaluations are needed to ensure the exercises are truly benefiting Soldiers' skill development in the ways intended.

The Army has demonstrated clear interest in developing the strategic thinking capacity of its leaders. The varying range of interest groups is a testament to the Army's motivation to improve advanced cognitive skills. Since their development, the exercises have been utilized for skill-development by several groups and organizations, including the School for Command Prep (Brigade Commanders), a United States Army Pacific Command (USARPAC) pilot program called Greenbook, a recently deployed operational Brigade cache of medical professionals, and the (USARPAC) Regional Leader Development Program (RLDP). Implementation of the strategic thinking exercises at different echelons of leadership has demonstrated the flexibility of the materials. The Army often has to train in conditions that are not ideal (e.g., too little time, too many participants, ad hoc instructors, inappropriate facilities, inappropriate temperatures, noisy settings). The exercises have proven to be flexible enough to implement successfully despite many of these adverse training conditions.

The exercises are currently being integrated into a "Managing Complex Problems" website that provides tips, tools, and resources to support Army leaders' ability to understand and manage complex problems. They are being augmented with videos of strategic thinking SMEs that describe the importance of the skills and offer examples of how to engage with different portions of the exercises.

To build upon this work, future evaluations should assess the impact of the exercises on development of the intended skills. This is no easy task since strategic thinking abilities in a military context take time to develop, making performance measurement a challenge. Lessons learned and additional suggestions for improvements should also be collected as instructors and unit commanders use them in their classrooms and with their units. In addition, researchers should explore ways in which the exercise materials can be optimized for use, particularly within an interactive multimedia format.

In developing and testing the exercises for strategic thinking, it became clear that developing this competency will be an extensive career-long process that requires developing understanding, practicing, getting feedback, and reflecting – consistent with cycles of adult learning and development (Kolb, 1984, 2015). Strategic thinking is multi-dimensional and therefore requires developing many overlapping and related skills that don't necessarily have to be isolated for useful practice and enhanced learning.

CONCLUSION

The Army needs tools and innovative methods for training complex cognitive skills. Methods and content must be flexible enough for use in classroom as well as operational settings. Since Army leaders spend most of their time in operational units, rather than classrooms, training methods have to be flexible enough for repeated use in the field. Additionally, if the training is to be sustained by operational units, the training content must be relevant to warfighting, flexible and readily updated so that it resonates with Soldiers. In reviewing the literature, the research team was unable to find this type of developmental material. The exercises developed with this research appear to meet those criteria. More research is needed to develop measures that can assess strategic thinking processes and outcomes in a military context to determine if the exercises have the long-term impact intended.

Acknowledgement: The research described herein was sponsored by the U.S. Army Research Institute for the Behavioral and Social Sciences, Department of the Army, Contract No. W911NF-14-C-0063.

Disclaimer: Opinions, interpretations, conclusions, and recommendations are those of the author and are not necessarily endorsed by the U.S. Army.

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