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for the Behavioral and Social Sciences

Research Report 1909

Innovative Methods to Acquire and Adapt Soldier Skills (INMASS) in the Operational Environment

Jennifer K. Phillips, William A. Ross
Cognitive Performance Group

Carl W. Lickteig
US Army Research Institute

Jeffery D. Livingston
Dynamics Research Corporation

August 2009

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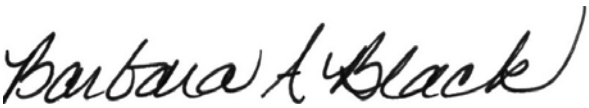

BARBARA A. BLACK, Ph.D.
Research Program Manager
Training and Leader Development Division

MICHELLE SAMS, Ph.D.
Director

Research accomplished under contract
for the Department of the Army

Cognitive Performance Group
Dynamics Research Corporation

Technical review by

Paula Durlach, U.S. Army Research Institute
Sena Garven, U.S. Army Research Institute

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14. ABSTRACT *(Maximum 200 words)*: This report documents an effort initiated by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to 1) specify a set of high-priority competencies required in counter-insurgency (COIN) missions, and 2) identify innovative training methodologies to help Soldiers acquire cognitive competencies for COIN. The analysis focused only on high-priority cognitive competencies. Following the analysis of COIN cognitive competencies, faculty from the Consortium Research Fellows Program (CRFP) identified innovative approaches to train performance of the competencies and their corresponding knowledge, skills, abilities, and attitudes (KSAAs). The CRFP consultants documented their recommended approaches in white papers that also examined requirements for development and implementation. The research team then considered the applicability of the training approaches to the identified COIN cognitive competencies and the feasibility of each approach for incorporation into the U.S. Army's training system in order to prioritize the training methodologies accordingly. As a result, recommendations were made on further development of the training approaches and multimedia demonstrations of the three most promising approaches were created and included in this report to promote future training development efforts.

15. SUBJECT TERMS
counter-insurgency, innovative training, cognitive skills, Soldier competencies, human performance

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Jennifer K. Phillips, William A. Ross
Cognitive Performance Group

Carl W. Lickteig
US Army Research Institute

Jeffery D. Livingston
Dynamics Research Corporation

Fort Knox Research Unit
James W. Lussier, Chief

U.S. Army Research Institute for the Behavioral and Social Sciences
2511 Jefferson Davis Highway, Arlington, Virginia 22202-3926

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- Dr. Jeremy Bailenson of Stanford University
- Dr. Brian Beatty of San Francisco State University
- Dr. Matthew Dunleavy of Radford University
- Dr. Charles R. Graham of Brigham Young University
- Dr. Steve W. J. Kozlowski of Michigan State University
- Dr. Richard E. Mayer of the University of California at Santa Barbara

We would also like to thank the Soldiers that were interviewed as part of our research. They demonstrated a high degree of honesty and frankness that highlighted their call to duty and braveness. They are true warriors.

INNOVATIVE METHODS TO ACQUIRE AND ADAPT SOLDIER SKILLS (INMASS) IN THE OPERATIONAL ENVIRONMENT

EXECUTIVE SUMMARY

Research Requirement:

The research requirement for this effort stems from the complex counterinsurgency (COIN) missions which underscore the need for innovative training approaches to develop the required Soldier knowledge, skills, abilities, and attitudes (KSAAs). The primary goal of this research effort, called Innovative Methods to Acquire and Adapt Soldier Skills (INMASS), is to improve the ability of Soldiers conducting COIN missions in the Operating Environment (OE). Since COIN missions require nearly simultaneous efforts to defeat the adversary while building up the community, Soldiers are required to make a wide range of complex decisions and judgments under circumstances that are largely new and unfamiliar. These tasks are cognitively complex and require a new class of Army training to adequately prepare our Soldiers for the challenges ahead of them.

The role of this effort is to conduct a front-end analysis for a new program of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) research on unit-focused training and to establish a theoretical and empirical foundation for guiding future research and development. The multimedia exemplars included in the report are demonstrations of pilot approaches for Army consideration and support.

Procedure:

The research focused on Soldiers at platoon echelon and below. The authors conducted a literature review along with Soldier interviews and surveys, and a data analysis to determine the cognitive challenges associated with the COIN environment.

Part of the literature review examined a sampling of the military publications to understand the performance challenges in the OE and the associated KSAAs required by Soldiers to meet those challenges. The findings served as a part of the empirical and theoretical foundation to support further investigation into training methods to meet the training challenges not currently being addressed or fully addressed by the U.S. Army. The literature review resulted in preliminary identification of six high-level cognitive skills critical for success in COIN missions:

- Sense Making.
- Perspective Taking.
- Rapid-Adaptive Decision-making.
- Continuous and Collaborative Horizontal Information Use and Decision-making.
- Creation and Sustainment of Collaborative Actions across Agencies and Groups.
- Shift across Requirements of Full-Spectrum Operations.

The Soldier interviews and surveys served two purposes. First, the research sought confirmation from recently OE deployed Soldiers that the cognitive skills identified in the literature review are indeed critical to successful COIN mission performance and currently under-addressed in Army training. Second, the effort generated additional context, from the Soldiers' perspectives, to extend the findings of the literature review. Specifically, the research team wanted to understand when and how the cognitive skills are applied in an operational environment, and what unique COIN challenges, impact the performance of those skills.

Every interviewee indicated agreement with the six cognitive skills identified as a result of the literature review, and was able to distinguish the skills that were of greatest importance to their mission. In some cases, interviewees identified additional skill areas related to cultural awareness or cultural sensitivity. Following a qualitative analysis, the research team identified six high-priority cognitive competencies:

1. Assess People.
2. Assess Situations.
3. Collaborate with Others.
4. Take Others' Perspective.
5. Adapt to the Situation.
6. Solve Problems Intuitively.

The research team provided the results of the COIN cognitive competency analysis to members of the Consortium Research Fellows Program (CRFP) for their recommendations of innovative and viable training approaches for preparing our Soldiers and leaders to conduct missions in a COIN environment. The objective was to identify viable and innovative training methodologies grounded in the science of learning and instruction. Six academicians who are members of the CRFP were selected by ARI for participation:

- Dr. Jeremy Bailenson of Stanford University
- Dr. Brian Beatty of San Francisco State University
- Dr. Matthew Dunleavy of Radford University
- Dr. Charles R. Graham of Brigham Young University
- Dr. Steve W.J. Kozlowski of Michigan State University
- Dr. Richard E. Mayer of the University of California at Santa Barbara

Five of the consortium members were asked to select at least one of the COIN cognitive competencies identified in the analysis and prepare a short white paper describing an innovative training solution to address the competency.

Each consortium member presented a distinct approach to training one or more of the COIN cognitive competencies. Across the set of five training approaches, each of the six cognitive competencies was addressed at least once. The research team then held a roundtable session that allowed the consortium fellows to present their training methods and field questions from the entire research team and other consortium members. The training methods presented were:

- Immersive Virtual Reality. This approach uses a digital representation system that supports individual development of assessment skills through a Virtual Human Interaction (VHI) environment. The training allows the individual learner to interact with avatars of self and others in order to experience other cultures and divergent perspectives.

- Hybrid-Flexible (HyFlex). This approach is an instructional theory intended to blend online and traditional classroom instructional activities. It provides for greater learner control over the content and delivery method. It also ensures that there is equivalency between methods that accommodate individual learning styles and goals.

- Augmented Reality. This approach uses a rapidly configurable learning environment that can be tailored to the cognitive requirements for COIN missions and Soldier tasks. In this approach, a mobile, global positioning system (GPS)-based, game-like learning environment is created to allow the Soldier to "navigate" an operating environment and practice the pattern recognition skills he is likely to use.

- Video Analysis. This approach employs video tagging and media annotation technology to practice and critique cognitive skills training. Video analysis and learning methods are particularly adaptable to blended learning settings where there may be a combination of live and constructive interactions used to support training.

- Active Learning. This approach employs a learner-centered model for instruction and is particularly suitable for developing skills needed to perform complex, cognitively-loaded tasks. The method addresses problem solving skills when critical thinking might be required to understand the problems and to generate action plans to resolve uncertainty or select a course of action.

Findings:

The research team then rated each training method for applicability and suitability. Based on these data, the Video Analysis approach was rated as the most highly relevant method to the COIN requirement across the research team. Video Analysis seemed to offer the greatest potential due to its applicability to COIN cognitive competencies and tasks, and its perceived feasibility as an instructional technology tool that is grounded in learning theory and viable as a methodology within the U.S. Army's training structure. Immersive Virtual Reality and Augmented Reality approaches offer sufficient promise for further investigation of their feasibility for Army implementation. Given their longer-term potential, HyFlex and Active Learning were not considered immediately suitable and not recommended for further examination, at this time.

Utilization and Dissemination of Findings:

Findings from this effort provide a theoretical and empirical base to guide ARI's future research and development on unit-focused training. The findings identify six high-priority cognitive competencies required in COIN environments and the Soldier knowledge, skills, abilities, and attitudes related to each competency. In addition, the results identify and describe how innovative training methods can help develop the required competencies. Demonstrations of the three most promising training methods illustrate how training applications might be developed and delivered across a range of low- to high-technology learner settings. Currently, ongoing research by ARI is applying the Video Analysis training method to record and analyze the operational performance of deployed units. The resulting video, tagged with lessons learned by experienced Soldiers, will provide authentic and "expert" guidance to other units and Soldiers preparing for deployment.

INNOVATIVE METHODS TO ACQUIRE AND ADAPT SOLDIER SKILLS (INMASS) IN THE OPERATIONAL ENVIRONMENT

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Introduction

Counterinsurgency (COIN) missions such as the current military operations in Iraq and Afghanistan require Soldiers and leaders to bring to bear a wide range of new competencies that are neither well specified nor adequately trained by the U.S. Army. Our enemies increasingly revert to unconventional tactics that mix modern technology with ancient techniques of insurgency and terrorism (Department of Army (DA), 2006). Most contemporary enemies aim not to defeat the United States through purely military means, but rather to undermine and exhaust U.S. public support and ultimately national will. To counter such insurgency, Soldiers and leaders in the operational environment (OE) face a growing challenge to continually learn and adapt, particularly to win the support and improve the welfare of the local people. This complex and often counterintuitive OE underscores the need for innovative training to acquire and adapt the required Soldier knowledge, skills, abilities, and attitudes (KSAAs) to succeed on the battlefield.

The OE requires Soldiers to acquire and employ a repertoire of new KSAAs more often associated with nonmilitary agencies in addition to more conventional military skills for combat. Field Manual (FM) 3-24, *Counterinsurgency*, stresses that the nature of a COIN campaign is a mix of offensive, defensive, and stability operations conducted along multiple lines of operations (DA, 2007). Even after acquiring the expansive set of KSAAs needed for COIN, the local and immediate situation requires a delicate balance between combat and non-combat KSAAs. Achieving this balance is not easy and requires leaders and Soldiers to adjust their approach constantly to situations ranging from a handshake to a hand grenade.

Soldiers and leaders may find themselves handing out soccer balls to kids in the street one minute, then fighting an insurgent stronghold the next, and then quickly reacting to an improvised explosive device, then treating the resulting civilian casualties. They must transition from humanitarians to warfighters to humanitarians without blurring the lines to maintain the support of the local population.

Soldiers and leaders in the OE are expected to be warriors, peacekeepers, and nation builders. Contemporary tasks include reestablishing local institutions, governance, security forces and the rule of law, and rebuilding infrastructure and basic services. The list of such tasks is exhaustive and performing them involves extensive coordination and cooperation with many organizations, agencies and individuals of disparate culture and language. Also, Soldiers in the OE serve as a moral compass that extends into the community in an insurgent environment that fosters violence, immorality, distrust, and deceit.

Since COIN missions require nearly simultaneous efforts to defeat the adversary while building up the community, Soldiers are required to make a wide range of complex decisions and judgments under circumstances that are largely new and unfamiliar. They must make sense of the immediate situation around them; assess and address the current need, whether it is collection of intelligence, support to a local businessman, or investigation of a potential weapons cache; continually update their understanding of community dynamics and insurgent networks; and establish relationships with local noncombatants. These tasks are cognitively complex and

require a new class of Army training to adequately prepare our Soldiers for the challenges ahead of them.

The purpose of this report is to document an effort initiated by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) to 1) specify a set of high-priority competencies required in COIN missions in the Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) environments, and 2) identify innovative training methodologies that show promise for preparing our Soldiers for COIN task requirements. Competencies required in COIN missions can be characterized as physical, cognitive, or affective. The analysis conducted as part of this effort focused only on cognitive competencies, primarily by examining mission tasks conducted at the small unit level, or platoon echelon and below.

The research began with an analysis of COIN cognitive competencies and the procedure and results of that analysis are reported. Following the analysis of COIN cognitive competencies, the research team consulted with academicians from the Consortium Research Fellows Program (CRFP) who are subject-matter experts in the area of learning sciences and instructional technologies, to identify innovative approaches to train performance of the competencies and their corresponding KSAAs. The CRFP fellows recommended a training approach for one or more of the COIN cognitive competencies. The analysts, in conjunction with ARI, then considered the applicability of the approaches to the full range of COIN cognitive competencies and the feasibility of each approach for incorporation into the U.S. Army's training system. Based on this examination, the innovative training approaches were prioritized for future development. The COIN Training Solutions section summarizes the CRFP's recommended training solutions, describes the procedure for identifying the approaches, and documents the outcomes of the prioritization process. Finally, recommendations for further development of the innovative approaches to train high-priority COIN cognitive competencies are provided in the Discussion section.

Analysis of COIN Cognitive Competencies

The purpose of the COIN cognitive competency analysis was to identify and prioritize a set of Soldier and leader required cognitive KSAAs for the full spectrum OE, focusing specifically on OIF and OEF mission environments, which are currently under-addressed by U.S. Army training and not amenable to the training methods currently in use by the U.S. Army. Following the identification of these cognitive KSAAs, the research team identified and examined innovative methods for training those elements of performance for their feasibility for further development.

The cognitive competency analysis was conducted in three stages. In the first stage, the research team reviewed the literature to develop an initial set of cognitive competencies and KSAAs from military publications, which included lessons learned documents and analyses of COIN cognitive tasks. In the second stage, the research team conducted interviews and administered surveys to Soldiers who recently returned from COIN mission type deployments. In the third stage, the research team analyzed the interview and survey data to identify, prioritize, and contextualize cognitive competencies to be addressed by innovative training solutions.

Procedure

Stage One – Literature Review

The objective of the literature review was to review a sampling of the military literature to understand the performance challenges in the OE and the associated KSAAs required by Soldiers to meet those challenges. The findings served as a part of the empirical and theoretical foundation to support further investigation into COIN cognitive performance requirements and unique training methods to meet the training challenges not currently being addressed or fully addressed by the U.S. Army.

A sample of military literature was provided for analysis by ARI. The sample was reviewed and prioritized. Additional literature was added to the priority documents based on the research team's knowledge of current research. Publications that were added, such as McCloskey (2007), Nobel, Wortinger and Hannah (2007), Phillips, Moon, Baxter, and Cooper (2008), and Ross (2008), were based on numerous recent interviews designed specifically to understand competencies and training needs and conducted with Army Soldiers and officers recently returned from the OE. As such, these texts represent current lessons learned, as do articles authored by military officers.

Twenty-one articles comprised the priority literature that was examined. They were reviewed and key phrases were entered into a matrix constructed to document the review. The research team erred on the side of inclusiveness in the first round of the review, and included all findings that may support our knowledge of cognitive KSAAs. The team concentrated on identifying aspects of cognitive performance that are difficult to train.

The second step in the literature review was the integration of the findings into one matrix, while refining the selection of items included. The findings were used to inform the final structure of the matrix, which is provided in Appendix A. Various KSAAs extracted from the literature were categorized by higher order cognitive skills. Thus, the primary column for the matrix in line with nature of the findings is the "Skill" column. Supporting knowledge, abilities, and attitudes that are associated with each skill are designated as subordinate to the skill. Due to the overlapping nature of performance elements in COIN operations, some elements of knowledge, abilities, and attitudes are repeated across the matrix for more than one higher order skill. In addition, performance challenges described in the literature were extracted and associated with the six skills as appropriate. The performance challenges, apart from describing what is difficult about COIN operations, serve in some cases to define the elements associated with the skill and in other cases to offer context or exemplars of the skill.

Terms were defined as follows:

- *Competency* describes a cluster of KSAAs an individual must possess or obtain (or circumstances that must exist) to perform one or more tasks in a particular job context.
- *Knowledge* describes a body of information, usually of a factual or procedural nature, applied directly to the performance of a function/task.

- *Skill* describes a present, observable competence to perform a learned act (could be motor, psycho-motor, and/or cognitive).
- *Ability* describes a general more enduring capability an individual possesses at the time when he/she begins to perform a task.
- *Attitude* describes an internal state that influences an individual's choices or decisions to act in a certain way under particular circumstances.

Though the term *ability* is sometimes used in this type of analysis to mean an enduring trait that is not trainable, this report uses abilities to mean those capabilities a person has or can develop as part of an overall competency.

The literature review resulted in the identification of six preliminary high-level cognitive skills critical for success in COIN missions:

1. Sense Making.
2. Perspective Taking.
3. Rapid-Adaptive Decision-making.
4. Continuous and Collaborative Horizontal Information Use and Decision-making.
5. Create and Sustain Collaborative Actions Across Agencies and Groups.
6. Shift across Requirements of Full-Spectrum Operations.

These six skills and their associated data (found in Appendix A) were then utilized to frame the interview protocol and survey implemented in the second stage of the competency analysis.

Stage Two – Soldier Interviews and Surveys

The objective of the Soldier interviews and surveys was twofold. First, the research team sought to confirm with Soldiers having recently returned from a OE deployment that the cognitive skills identified in the literature review are indeed critical to successful COIN mission performance and currently under-addressed in Army training. Second, the research team wanted to generate additional context, from the Soldiers' perspectives, to extend the findings of the literature review. Specifically, this effort sought to understand when and how the cognitive skills are applied in an operational environment, and what challenges unique to the COIN mission impact the performance of those skills.

Interviews. An interview protocol organized around the six cognitive skills was generated. The protocol, which is included in Appendix B, utilized a Task Diagram approach (Militello & Hutton, 1998) to elicit, in the Soldiers' words, the range of jobs or tasks they performed as part of the small unit COIN mission. The Task Diagram required interviewees to provide between three and six major tasks or activities. They were then queried about which tasks were most critical to mission success, and which tasks they were least prepared to perform (i.e., the tasks that were under-addressed in pre-deployment training). Following the Task Diagram, the interview protocol shifted to a line of questioning organized around the six cognitive skills identified in the literature review. Interviewees were asked whether the six skills resonated with them as critical to COIN operations, and were then queried to provide examples

from their lived experiences of when and how they implemented the skills in the context of specific events. In this stage of the interview, the interviewers collected a range of incidents of complex COIN mission tasks and requirements, whether or not they were related to the six aforementioned cognitive skills. As the Soldier described their operational experiences and the tasks that were required, interviewees probed about KSAAs required to perform the tasks well, or aspects of performance that separated superior performers from average performers. The interviewers also queried Soldiers for incidents in which new tactics or approaches were developed and implemented while deployed, with the aim of identifying new best practices and elements of performance in theater.

We conducted 13 interviews in two separate rounds of interviewing. The first round took place at Fort Knox, Kentucky. Three sergeants first class were interviewed individually for two hours each. The second set of interviews took place at Fort Carson, Colorado. One lieutenant colonel, two majors, three captains, two lieutenants, a master sergeant, and a sergeant first class were interviewed individually for approximately two hours each. All interviewees had at least one recent deployment to the Iraqi theater. A range of roles was represented by the interviewees, including Special Troops Battalion Operations Officer, Infantry Battalion Operations Officer, Headquarters & Headquarters Troop Commander, Infantry Platoon Leader, Infantry Platoon Sergeant, Scout Platoon Sergeant, Battery First Sergeant, Military Transition Team member, and Battalion Logistics Officer. All interviews followed the interview protocol, and were recorded and transcribed for later analysis.

Note that while our research focus was on cognitive competencies required by small units, some of the individuals interviewed operated at higher echelons. To the extent possible, the research team interviewed those individuals about the impact of their jobs on the "Soldier on the street" in order to maintain our small unit focus. When data regarding higher echelon responsibilities was captured, it was excluded from analysis.

Surveys. In addition to the interview protocol, a Soldier survey was developed based on the KSAAs identified in the literature review. The survey consisted of five sections:

- *Part 1. Demographics*. The first section captured the respondent's rank, years of experience, and billet, training, and deployment history.
- *Part 2. Learning Elements of COIN Performance*. The second section required respondents to rate, on a five-point Likert scale (Likert, 1932), the difficulty associated with learning how to perform 71 cognitive tasks that were identified as part of the COIN literature review.
- *Part 3. Impact of Elements of COIN Performance on Mission Success*. This section required respondents to rate, on a five-point Likert scale, the criticality of the same 71 cognitive tasks for COIN mission success.
- *Part 4. Training Necessity and Priorities for Individual Attributes and Abilities.* In the fourth section, respondents were asked to consider 77 individual abilities and attributes, all of which were taken from the literature review findings, and indicate 1) whether the ability/attribute is a training necessity, 2) whether problems with training that ability/attribute are isolated versus widespread in the Army, and 3) whether the training priority for that ability/attribute is, in their opinion, high, moderate, or low.

- *Part 5. Distinguishing Superior from Average COIN Performers.* In the final section of the survey, respondents were asked to again consider the 77 individual abilities and attributes, and rate on a five-point Likert scale the extent to which the ability/attribute is one that differentiates superior COIN Soldiers from average Soldiers.

The surveys were administered to 17 Soldiers representing a range of ranks and deployment experiences. Nine individuals from Fort Carson and eight from Fort Stewart completed the surveys.

Stage Three – Data Analysis

The research team utilized the findings from the literature review as a starting point to conduct the analysis of the interview and survey data. All interviewees indicated agreement with the six cognitive skills identified as a result of the literature review, and they were able to distinguish the skills that were of greatest importance to their mission. In some cases, interviewees identified additional skill areas, most of which related to cultural awareness or cultural sensitivity. The research team grouped this cultural awareness/sensitivity skill as a subset of the second skill, Perspective Taking.

Two trained cognitive task analysts, both of whom had participated in all the interviews, collaboratively analyzed and represented the qualitative data. Interview field notes, transcripts, and survey data were compiled and analyzed. The first step was to extract cognitive competencies and KSAAs in support of COIN mission performance from the interview notes and transcripts. Next, the researchers entered these elements of cognition as nodes in a concept map using the CMapTools software. The CMapTools supported our qualitative analysis by enabling us to represent and organize the data captured during the interviews. At this stage of analysis, no attempt was made to label the different elements of cognition or performance. However, the analysis attempted to generate a loose hierarchy, such that supporting cognitive elements were subordinate to higher order domain-specific tasks or cognitive competencies.

Once all the elements of cognition were extracted from the data records, the second step was to organize the elements according to their relationships with each other (e.g., skills and abilities that support a broader competency) and with newly created nodes representing the cognitively complex COIN mission tasks described by the Soldiers (e.g., collection of Human Intelligence (HUMINT) or working with an interpreter). Here, the research team generated links between the nodes to describe the nature of the relationships as reported to us by the Soldier interviewees. For example, relationships (in italics) took the form of:

- Node 1 *requires* Node 2.
- Node 1 *is done in the context of* Node 2.
- Node 1 *is done in order to* Node 2.

The third step was to iterate the organization of the cognitive competencies, tasks, and KSAAs in the concept map. The two analysts sought to distinguish five to seven critical undertrained COIN cognitive competencies that are amenable to innovative training techniques due to their cognitive complexity. The intent was to identify aspects of performance that could

not be trained as procedures, but rather entail decisions and assessments mitigated by a range of situational factors. With the understanding that the cognitive competencies identified in the analysis must be described at a level that supports identification of a training solution, the analysts gave much consideration to the appropriate granularity of the reported competencies. For example, a competency too broad in scope might preclude a well-defined training methodology with appropriate measurement standards. In contrast, a very specific competency would demand a very detailed training approach, which might not be applicable to a range of COIN cognitive tasks and thus fail to justify the expense of its development. The analysts determined that a set of competencies roughly one step lower than those captured in the literature review would be at an appropriate level given the programmatic goals. For example, the Sense Making skill from the literature review was further broken down into two more meaningful cognitive competencies: 1) Assess People and 2) Assess Situations. Throughout this process of identifying five to seven COIN cognitive competencies, the analysts received continuous inputs from a military subject matter expert who was involved in all the interviews as well as a senior ARI researcher. This step resulted in the following six high-priority cognitive competencies:

1. Assess People.
2. Assess Situations.
3. Collaborate with Others.
4. Take Others' Perspective.
5. Adapt to the Situation.
6. Solve Problems Intuitively.

With the goal of conforming to the structure of the Army's Systems Approach to Training, the team sought to specify Tasks to be trained along with their associated Conditions and Standards. Therefore, within each of the six competencies the analysts and military subject-matter expert specified three COIN cognitive tasks. Conditions and standards were described for one of the tasks within each competency, along with several specific KSAAs reported by Soldiers as necessary to perform those tasks. Further, to support the generation of viable innovative training methodologies, analysts provided a set of examples of the contexts in which Soldiers perform the tasks in the OE.

In conjunction with the analysis of interview data, the researchers considered the survey responses to guide the identification of critical COIN cognitive competencies. Due to time constraints, the analysts generated surveys using the KSAAs identified in the literature review and administered them simultaneously with the conduct of interviews. Although it would have been preferable to complete the interview analysis prior to generating and distributing the surveys so that the survey data could help prioritize the cognitive competencies identified by interviewees, the research team was able to use survey responses to confirm that performance elements related to the six specified competencies are viewed as important to survey respondents.

Results

The scope of the analysis focused on cognitive competencies and related cognitive tasks that have been repeatedly reported as central to COIN missions. The goal was not to identify a comprehensive and exhaustive set of competencies and tasks. To the extent possible, the analysts attempted to provide a range of competencies and tasks that would allow the consortium of training subject-matter experts to best match their innovative training methods with training requirements. As a result, an array of innovative training methods might be identified that can apply to a wide range of COIN requirements, and be reasonably incorporated into an overall training plan for the Army.

A *competency* describes a cluster of KSAAs an individual must possess or obtain to perform one or more tasks in a particular job context. The researchers sought to identify COIN high-priority cognitive competencies for mission success in COIN which are not addressed or not comprehensively addressed in current U.S. Army training, and for which innovative training methodologies may be more appropriate than existing techniques. The results provided in this report used findings from the COIN literature review and the experiences of Soldiers who have recently participated in COIN missions to identify a set of cognitive competencies and associated cognitive tasks necessary for successful mission performance.

We advise the reader that validation of our results by active duty military personnel was not within the scope of this effort. While the authors stand by the effectiveness of our qualitative research methods for achieving our program objectives and identifying a set of COIN cognitive competencies and their associated training requirements, the authors stress the importance of a validation and verification step prior to utilizing these results for the design or development of any training applications.

Results of the competency analysis are provided in two sub-sections: 1) Description of Cognitive Competencies and 2) Training Requirements Tables. In Description of Cognitive Competencies, the six competencies are identified and described, and three cognitive tasks are identified within each as typical tasks Soldiers conduct across a range of mission tasks and operational circumstances. In the second section, Training Requirements Tables, one of the cognitive tasks is detailed for each competency. The task is documented in the Task-Condition-Standard form. Knowledge, Skills, Abilities, Attitudes, and Tools relevant to the task are documented. Brief descriptions are provided for contexts in which the task is applied. Finally, examples are supplied of how skilled Soldiers and leaders have learned, through experience, to conduct the task successfully.

Description of Cognitive Competencies

Successful conduct of COIN operations depends on thoroughly understanding the society and culture within which they are being conducted (see DA, 2006). In most COIN operations in which U.S. forces participate, insurgents hold a distinct advantage in their level of local knowledge. They speak the language, move easily within the society, and are more likely to understand the population's interests. Thus, effective COIN operations require a greater emphasis on certain skills, such as language and cultural understanding, than conventional

warfare. The interconnected, politico-military nature of insurgency and COIN requires immersion in the people and their lives to achieve victory.

The six high-priority cognitive competencies are elaborated as follows:

Assess People. In the current COIN fight in Iraq and Afghanistan, Soldiers are continuously interacting with the local population including police, Army personnel, governmental officials, and residents. The ability to determine the motivation and trustworthiness of individuals is vital to the mission of providing appropriate stability and support to the population. Also, the ability to determine the influencers in the community helps to identify individuals whose involvement will facilitate and speed development efforts in the community. There are many instances when a Soldier must quickly size up an individual who is providing information on a possible insurgent in the neighborhood, or being considered for a position as a local official, or watching as a patrol drives down the street. Whether or not that Soldier takes a particular action depends in part on his or her assessment. In some cases the Soldier's goal is to determine whether the individual is one of the "good guys." In other cases, the Soldier's goal is to be aware of who holds power in the neighborhood, or what agendas are being pushed. Three important cognitive tasks for "Assessing People" are:

1. Determine the trustworthiness of an individual.
2. Identify the influencers in a group.
3. Identify the motivation of an individual from another culture.

Assess Situations. The COIN environment is complex and changes rapidly. Information needed by Soldiers to understand the insurgent network and its activities is collected, processed, and disseminated using a variety of means. The available information is vast and is distributed to users rapidly to ensure that situational awareness can be shared and kept current across the force. Information about a situation is also embedded in the environment as cues. The challenges faced by operating forces to develop and maintain a solid understanding of the situation include interpreting what is happening in the situation now and assessing whether an immediate threat exists. To do so, Soldiers must have an understanding of what "normal" looks like for the area of operations – what is typical with regard to how individuals act, how they gather, when they send their kids to school. Soldiers also must use situational cues to assess whether there is danger in the immediate area, such as from an emplaced Improvised Explosive Device (IED). In part, Soldiers apply their understanding of what is normal to determine whether the current set of situational cues is normal or not. For example, if kids should be getting out of school right now and there are no kids in sight – then it is likely that a threat to the patrol exists. Soldiers also must recognize minute changes in the terrain around them to judge the situation. If a barrel on a street has moved from where it was yesterday, for example, it may be that the movement was deliberate and an IED is placed behind the barrel. Soldiers need practice in filtering information and identifying what is relevant for tactical problem solving and decision-making. These sense making skills are the foundation for rapid decision-making because they enable the deliberate, conscious process of fitting data into a context so that relationships and patterns are usable and clear. The context may be conveyed as a story, script, map, or other form of representation; the intention is to apply sense making skills to reduce

complexity and simplify the situation in relation to a particular mission goal. Three important cognitive tasks for "Assessing Situations" are:

1. Use situational indicators to recognize danger.
2. Rapidly familiarize to identify what is normal in a particular environment.
3. Detect changes in the environment from one day to the next.

Collaborate with Others. Soldiers must operate across lines of effort for which they may have limited training or experience. Initiatives to restore economic, social, and governmental institutions often involve individual Soldiers or their tactical units. The ability to perform these types of military tasks will prove critical in shaping the COIN environment for success. These tasks will involve relationship building and understanding new teams and organizations. Soldiers will require the ability to see the big picture and to create contexts that are secure and well planned. There are countless interactions between military and civil institutions which will contribute to mission goals. The actions of Soldiers that are most successful will rely heavily on their communications and planning skills, as well as their ability to adapt their know-how to solve new problems in social, political or economic contexts. Language and cultural awareness, while important, may not be the determining factors. More likely, rapport and understanding are likely to result in breakthroughs and progress to a more resilient and secure operational environment. Three important cognitive tasks that make up "Collaborating with Others" are:

1. Facilitate development of community government.
2. Develop partnerships with civic institutions.
3. Bargain and negotiate.

Take Others' Perspective. Perspective-taking is the ability of a Soldier to project himself/herself into the situation of another person as a result of (cultural) knowledge and empathy, in order to "obtain and reflect a reasonably complete and accurate sense of another's thoughts, feelings, and/or experiences." Perspective-taking allows one to understand the goals and interests of another person or group and, with experience, to make reasonable predictions about their behavior. Acquiring and using one's understanding of the thoughts, feelings, and motivations of other people provides a social perspective that plays an important role in how successful COIN operations are conducted. Everyone with whom a Soldier interacts has an agenda. It is important for mission success that Soldiers be able to identify these agendas and assess what motivation is behind them. Perspective-taking can reveal the agenda and motivation behind the decisions of others (adversaries and neutrals) and yields improved predictions about actions or threats that may emerge. Effective questioning and listening skills in encounters and relationships with civilians will contribute to the Soldier's ability to size up an individual and assess how or whether these relationships will prove valuable. Three important cognitive tasks for "Taking Others' Perspective" are:

1. Think like a noncombatant.
2. Think like an insurgent.
3. Build relationships.

Adapt to the Situation. Soldiers and leaders must maintain an understanding of the situation surrounding them and make decisions appropriately. Adaptive decision-making requires dynamic adjustments to evolving situations and a range of very different tasks across the operational spectrum. For example, one line of effort may involve defeating the insurgents in a fire fight or through information collection in order to identify and capture them. Another line may entail supporting the community, at individual and group levels. Yet another may require training and advising host nation security forces. Changes in the situation often change the priority of effort. For example, Soldiers will need to adapt from HUMINT collection mode to firefight mode when they "stumble" into an attempted ambush. Soldiers often state that rapid increases in level of aggression are less difficult than rapid decreases in aggression, when, for example, locals who are not a threat are encountered during the conduct of a raid. Three cognitive tasks important for "Adapting to the Situation" are:

1. Shift across combat and stability operations.
2. Predict second and third order effects.
3. Think before you act.

Solve Problems Intuitively. Intuitive problem solving is the ability to combine one's knowledge of the current situation with prior experience to solve new problems. It is one characteristic that separates experts from less proficient performers. Problem solving in this context describes the process that Soldiers in a COIN environment use to become aware of events that are taking an unexpected or unacceptable direction. The Soldier must demonstrate logical reasoning, pulling from their base of knowledge and experience, to make sense of complex or ambiguous situations. They assemble and organize information to judge its sufficiency, completeness, and accuracy as he pursues understanding of key cause and effect relationships, such as who is financing the insurgents in the area of operations or where a targeted individual is hiding. The performance relies on the ability to assess situations and individuals. It typically involves the use of mental simulation skills to develop timelines and fill information gaps in the story, much as a detective would, or to project future outcomes and end-states to envision how the story will play out in the future. Effective problem solving implies a strong tolerance for ambiguity, a determination to find closure, and willingness to pursue factual information to confirm or reject hypotheses that offer explanations under time pressure. The important cognitive tasks for "Solve Problems Intuitively" are:

1. Infer the missing pieces of a story.
2. Mentally simulate events.
3. Recognize inconsistencies in information.

Training Requirements Tables

This section examines more thoroughly six of the 18 cognitive tasks identified above. The information is presented by the *Task*, *Condition* and *Standard* of performance that would be expected of a Soldier at platoon echelon or below conducting the cognitive task. In addition, the Knowledge, Skills, Abilities, Attitudes, and Tools that are used to perform the task in a COIN context are listed. The report provides context examples of where and when the task is performed along with a description of skilled performance for each context example in the table.

Table 1

Cognitive Competencies

Competency 1: Assess People				
Task: Determine the trustworthiness of an individual.				
Condition: The Soldier is in a counterinsurgency environment. The Soldier is talking to, interrogating, or negotiating with a member of the indigenous population, military, government, or civilian. The Soldier is obtaining actionable information for military or civil purposes.				
Standard: Classified and verified an individual as trustworthy or not.				
Knowledge	Skill	Ability	Attitude	Tool
▪ Local customs. ▪ Social systems within sector. ▪ Threat activities in sector. ▪ Key words and phrases. ▪ Cultural norms and values, such as "perceived corruption" as a way of life in some cultures.	▪ Interpretation of body language, and hand and facial gestures. ▪ Tactical questioning. ▪ Employing key words and phrases in conversation. ▪ Listening for and learning new key words and phrases. ▪ Cross-cultural communications through an interpreter. ▪ Engaging a foreign national in a conversation. ▪ Use of common interests to build rapport. ▪ Verification of information based on other known intelligence. ▪ Negotiation. ▪ Reasoning, e.g., to determine whether individual's presence or absence corresponds to significant threat events. ▪ Observation of individual's behavior and changes in behavior.	▪ Creating trust. ▪ Building rapport. ▪ Active listening. ▪ Adapting style based on information acquired about individual's communication preferences. ▪ Effortless communications (e.g., ability to be a "people person").	▪ Patience. ▪ Understanding. ▪ Assertiveness. ▪ Respect. ▪ Sincerity. ▪ Objectivity.	▪ Intel packet. ▪ Interpreter. ▪ Informants. ▪ Points of contact. ▪ Civilians. ▪ Children. ▪ Target sheet (i.e., the summary cover sheet for the Intel packet).

(Table Continues)

Context Examples:

1) During HUMINT collection task, Soldier must judge whether the person providing information is trustworthy or not to judge the credibility of the information. Furthermore, Soldier must judge the trustworthiness of an individual who is being considered as a regular informant.

2) In the context of combined operations with or training of host nation security forces, Soldier must assess trustworthiness of individuals to assess whether they are working with or against the American forces.

3) In the context of recruiting candidates for leadership positions, i.e., in local government, police organizations, or military forces, Soldier must assess the trustworthiness of individuals to determine their suitability as leaders.

4) In the context of economic development efforts, Soldier must assess trustworthiness of contractors proposing to bid jobs, and individuals requesting community development projects to determine their motivations.

Examples of skilled performance for the contexts above:

1) When questioning individuals about insurgent activities or other knowledge they may have, skilled Soldiers report the ability to read body language to tell whether they are telling the truth. Indicators of lying include being unable to look you in the eye, or nervous hand jitters – e.g., rubbing thumb against finger or nervously playing with object in hand. Experts also use the answers to questions to gauge whether the individual is being honest. If his or her story does not match with what is known to be true as a result of other HUMINT collection and analysis efforts, then the expert may judge the individual to be hiding something or lying for another purpose.

2) Skilled Soldiers notice cues about members of the host nation security forces that indicate they may be either aware of insurgent attacks, or actively involved in the insurgency. For example, in one situation a Soldier noticed that the Iraqi unit commander rarely wore protective gear during a combined operation such as a patrol, but on occasion he would wear the gear. The Soldier knew to expect an attack anytime LTC X wore gear. This translated into an assessment that LTC X was not trustworthy, because he knew of the attacks before they occurred but never informed anybody of them. Similarly, experts notice that when host nation police or military personnel are overly friendly – e.g., they run up and say hello and pat you on the back every time you enter the room – they are most likely trying to cover their involvement in the insurgency. These overly friendly individuals also tried to elicit information from U.S. Soldiers.

(Table Continues)

3) Skilled Soldiers recognize who the main influencers are in the community by paying attention to the group interaction. Those served first, addressed with respect, and seated at the head of the table are locally recognized as leaders. The Solders will also pay attention to body language of the proposed leaders to determine truth telling or deception. In addition, skilled Soldiers know to take advantage of relationships they have built with other locals, by asking them in confidence who is trustworthy and who is not.

4) Soldiers in contracting roles will treat contractors in the host nation just as they would contractors in the U.S. They look at work previously completed, check with previous clients, and verify quality to assess whether the contractor is trustworthy enough to be rewarded a job. In cases when that is not possible, they watch body language, analyze the conversation for clues of truth telling, or question the contractor several times posing the same questions in different contexts to see if there are any incongruities.

(Table Continues)

Competency 2: Assess Situations

Task: Use situational indicators to recognize danger.

Condition: The Soldier is in a counterinsurgency environment. The Soldier is conducting a mission during which he may be attacked by an IED, small arms fire, grenades, or other threats.

Standard: Detected situational indicators of attack and avoided injury to Soldiers or damage to vehicles.

Knowledge	Skill	Ability	Attitude	Tool
▪ Tactics, techniques, and procedures (TTP) for conducting combat patrols. ▪ Unit Standard Operating Procedure (SOP) for roles and responsibilities, specifically fields to scan by position. ▪ Recent insurgent activity in the area, including specific IED hot spots. ▪ IED components. ▪ Indicators of emplaced IEDs. ▪ "Normal" behaviors for the local populace.	▪ Detect minute changes in the environment from the last time it was seen, e.g., barrels moved from one spot to another. ▪ Identification of IED indicators in the environment. ▪ Identification of abnormal behaviors of people in the environment. ▪ Taking other's perspective, e.g., to envision how insurgents would conduct attack in a specific location. ▪ Communication of information across the unit, e.g., of threat indicators. ▪ Interpretation of locals' hand or facial gestures, e.g., when they are trying to warn of danger. ▪ Interpretation of body language. ▪ Focus outward on the surrounding terrain and situational cues rather than inward on individual's or patrol's task.	▪ Recognition of patterns suggesting threats. ▪ Interpretation of the behaviors of individuals and groups. ▪ Mental simulation, e.g., of how an insurgent could have planned an attack. ▪ Develop relationships with locals, to increase likelihood that they will warn of imminent attack.	▪ Vigilance. ▪ Thoroughness. ▪ Focus.	▪ Intelligence reports. ▪ Unmanned aerial vehicle (UAV). ▪ GPS. ▪ Interpreter. ▪ Trends analysis. ▪ Battlefield update. ▪ Force XXI battle command-brigade and below (FBCB2) and Blue Force Tracker. ▪ Informants.

(Table Continues)

Context Examples:

1) During the course of every patrol or mission in both urban and rural settings, Soldiers use perceptual cues in the environment to make judgments about whether they are in or entering a danger area. The area may be dangerous because an IED is emplaced nearby, an ambush is waiting ahead, or some other form of attack is imminent.

2) During the course of a raid or building clearing, when Soldiers enter a building or residence they must assess whether they are in danger. They use perceptual cues from the environment, including the people and their behaviors, to determine risks.

3) During preparation of a combined mission with host nation security forces, Soldiers may see indicators in the behaviors of the host nation forces that danger is imminent, suggesting that those individuals may have more information about insurgent activities than they have shared, or even that they may be involved in the insurgency.

Examples of skilled performance for the contexts above:

1) In the context of a patrol mission, the expert brings to bear background knowledge of recent insurgent activity and recent events that could induce retaliation by the insurgents, such as the capture of a key member of the insurgency. He uses his knowledge of what has happened recently and actively looks for indicators in the environment that, when fit together, produce a pattern of information that suggests a potential attack. More specifically, he thinks back on previous incidents in the neighborhood and to assess probable times for IED attacks (e.g., toward the end of a patrol mission, when Soldiers are fatigued) and locations suitable for an IED attack (e.g., prior "hot spots," culverts, bridges, intersections) along the route. He takes the perspective of the insurgent and thinks through the IED attack mechanism: targeting, emplacement, tracking, triggering, and escaping. He recalls what this street looked like last time he patrolled, and he attempts to detect changes from then to now. He watches the behavior of the people in the area. If groups are absent in an area where they typically gather, it may be because they know there is danger. If kids are not around when school should be letting out, it may be because their parents knew of danger and kept them away. If two or three men are together and focusing on the patrol, it is an indicator of danger. If anything about the situation is different from "normal," including things like cars being parked in spots where they have never before been parked (could indicate car as aiming post for triggering IED), or the store owner's car being absent (could indicate his knowledge of IED nearby), then the expert will judge that an attack is more likely and take steps accordingly. Experts also consider aspects of the terrain that may be favorable for insurgents, such as tall buildings with line of sight to a potential kill zone, easy escape routes, and berms where a triggerman could easily hide.

(Table Continues)

2) In the context of a raid or building clearing, the expert quickly sizes up the inside of the building or residence by looking for signs of criminal activity (e.g., IED components or materials for assembly, such as copper wire or transmitters/receivers) and signs of guilty or nervous inhabitants.

3) In the context of preparation for a combined mission, experts pick up on danger cues such as an individual in the host nation forces wearing more protective gear than he usually does, or an individual who always leads the dismounted patrol requesting to sit out for this mission, or not lead the patrol today. These indicators reveal both that an insurgent attack may be planned, and that the individual has important knowledge about the insurgent network.

(Table Continues)

Competency 3: Collaborate With Others

Task: Facilitate development of local governance.

Condition: The Soldier is in a counterinsurgency environment. The Soldier supports community leaders with the establishment and operation of governing councils.

Standard: Developed community action plan based on inputs from civil leaders.

Knowledge	Skill	Ability	Attitude	Tool
▪ Culture values and norms. ▪ Programs and civil affairs projects. ▪ Social system within sector. ▪ Key words and phrases in the local language. ▪ Action plan for community improvement. ▪ Know to keep promises and not over-promise. ▪ Knowledge of how the funding system works.	▪ Setting goals or end-states. ▪ Communicating ideas with clarity. ▪ Engaging a foreign national in a conversation. ▪ Identifying influential people based on their behavior in meetings. ▪ Maintaining a record of information/issues discussed in meetings. ▪ Leveraging relationships and information. ▪ Coaching or mentoring counterparts. ▪ Managing time. ▪ Filtering information and messages by priority. ▪ Communicating through an interpreter. ▪ Assessing the intents and needs of others. ▪ Bargaining and negotiating. ▪ Reaching closure on issues or actions. ▪ Identifying leaders who are trustworthy. ▪ Determining motivations of others.	▪ Taking other's perspective. ▪ Building rapport with key individuals. ▪ Actively listening. ▪ Generating options or solutions. ▪ Trading-off and prioritizing actions.	▪ Understanding. ▪ Openness to ideas. ▪ Respect. ▪ Sincerity. ▪ Empathy. ▪ Patience. ▪ Calm demeanor.	▪ Agenda. ▪ Interpreter. ▪ Target list. ▪ Engagement worksheet. ▪ Census. ▪ Area study. ▪ Civil Affairs team. ▪ Message from the mosque.

(Table Continues)

Context Examples:

1) Unit Leader organizes and conducts the bi-weekly neighborhood council meeting as the senior U.S. representative. He is normally accompanied by an interpreter and a member of the Civil Affairs team, which supports his company from Brigade. In preparation for the meeting he must prepare an agenda and anticipate issues that may arise.

2) At the bi-weekly neighborhood council meeting, a number of issues are raised. Often the Soldier will feel that some of the issues and requests are outlandish or unnecessary, either because they are too expensive or seem to benefit specific factions or members. The Soldier will often be tested during these meetings. He must assess personal agendas that may be driving some of the requests, and use negotiating skills to influence the Council's decisions.

3) During the social period preceding the District Council meeting, intelligence may be gathered. The purpose of the social period is to adhere to local customs involving hospitality and renewing personal acquaintances, so business discussions are inappropriate. A Soldier must use this time effectively to develop relationships while adhering to local customs.

Examples of skilled performance for the contexts above:

1) In the case of organizing and conducting meetings, skilled leaders know to exchange cell phone numbers with the Council Leader so that they can develop an agenda and issues mutually. They use alternative means to get closer to influential individuals and gain an appreciation of how best to nurture a sense of pride and empowerment in the local leaders. Their intent is to assist in expectation setting by coordinating the actions of the group and to keep projects aligned with the Civil Action Plan for the neighborhood. Skilled Soldiers and leaders understand their role is to facilitate and act as a coach, and not to serve as the de facto leader of the Council.

2) In the case of managing outlandish requests during the course of meetings, the skilled performer anticipates that there will be a phase in which Council members try to see how far they can push him. He has an understanding of how to transact business with contractors in Iraq and knows not to be offended by overt actions of persuasion or manipulation. He takes this as a sign of acceptance and positional power, instead of testing him. He knows to keep a calm yet strong demeanor and not to respond emotionally, even though requests may be deserving of a laugh or a verbal explosion. He engages in the conversation, listens attentively, and is careful to provide indirect responses to requests and questions. He knows to not make promises that he is not sure he can keep. He operates within his level of authority and knows when to invoke the name of the Commander.

(Table Continues)

3) During the social period prior to the meetings, the skilled Soldier or leader knows to remain a good listener and use this time to make contacts with the Council members. He knows that each person has an agenda and wants something from him or his commander. He makes himself accessible and uses his limited language skills and an interpreter to conduct less formal, off-line business discussions. These one-on-one discussions help to build relationships and rapport between individuals. He exchanges "business" cards with his cell phone number as part of the interaction. On one actual occasion, the S3 who attended with the Battalion Commander was approached by several individuals who want to converse and offer to help him with his language skills. Each took the time to pronounce and write key phrases in his notebook. One individual made an indication in the notebook that he wanted to share information about activity in the district, which may have had intelligence value. The S3 arranged, also using the notebook, for a secret follow-up meeting with the individual in a way that would ensure no one would suspect him of providing information to the U.S.

(Table Continues)

Competency 4: Take Others' Perspective

Task: Think like a noncombatant.

Condition: The Soldier is in a counterinsurgency environment. The Soldier is attempting to look at the world through the eyes of another individual or group to judge the other's future actions. The Soldier may or may not be interacting with the individual or group at the time that he is attempting to take the perspective of another.

Standard: Accurately predict how an individual from another culture will respond to an event or message.

Knowledge	Skill	Ability	Attitude	Tool
▪ Cultural cues, such as behaviors or phrases that are judged as disrespectful or showing weakness. ▪ Individual values and norms, such as authority of male head of household. ▪ Awareness of cultural differences beyond customs; cultural self-knowledge; dimensions of cultural difference. ▪ Social networks within a community. ▪ Stereotypes to avoid. ▪ Past behaviors of others, such as where and when IEDs have been emplaced. ▪ Knowledge of what actions by U.S. Forces prompt insurgent retaliation. ▪ Knowledge of unintended intimidating effects of one's own actions, appearance, and language. ▪ Recent history of the population, e.g., last 25 years. ▪ Information operations themes.	▪ General problem solving. ▪ Interpersonal skills such as rapport, empathy, and communication. ▪ Interpreting body language and facial expressions. ▪ Assessing people. ▪ Communicating through an interpreter. ▪ Making small talk and conversing with civilians. ▪ Judging the credibility of sources based on message content. ▪ Judging the credibility of information. ▪ Focusing outward on the other individual rather than inward on one's own thoughts and feelings.	▪ Cultural sensitivity. ▪ Anticipation of cross-cultural conflicts. ▪ Mental simulation to predict future actions and responses. ▪ Mental simulation to build a coherent story of past events. ▪ Use of perceptual filters to interpret responses. ▪ Treating residents with respect.	▪ Cultural empathy. ▪ Conscientious ▪ Patience ▪ Respect ▪ Tolerance for ambiguity. ▪ Tolerance of culture shock. ▪ "Being yourself."	▪ Intel packet. ▪ Language translation device. ▪ Priority Information Requirements (PIR). ▪ Battle update briefing. ▪ Identity papers ▪ Rules of Engagement. ▪ Crime statistics for the area. ▪ Camera.

(Table Continues)

Context Examples:

1) During any operation involving local noncombatants, such as a house clearing operation or raid, a presence patrol, a HUMINT collection effort, and so forth, Soldiers make contact with and interact with noncombatants. Soldiers must consider how the noncombatants will interpret the words and actions of the U.S. Forces (and host nation security forces, if applicable), to refrain from behaviors that will be offensive or deemed disrespectful. Soldiers also attempt to show strength to the locals in order to gain their respect.

2) During a communication with members of the local government or HUMINT sources, Soldiers must empathize with community members to predict the credibility of the information being provided, the motivations for providing certain information or requests, and the perception that the individuals will have about what the Soldier is communicating to them.

3) During combat patrols conducted in an urban area, the Soldier may come upon young male civilians who are breaking the curfew. The Soldier must take immediate actions that maintain the curfew restrictions without escalating the situation.

Examples of skilled performance for the contexts above:

1) In the context of a raid, skilled Soldiers know who they are looking for before entering the building, based on the intel packet received from the S2. If the targeted individual is not found in the house, skilled Soldiers know to be respectful to the inhabitants throughout the operation. They take the perspective of the inhabitants both in terms of the culture of the inhabitants (actions that are seen as weak or disrespectful) and basic human reactions to being disturbed in one's home. They know that damage to property and disrespect to individuals will have severe repercussions in the future; noncombatants who have a bad experience with the U.S. Soldiers may at worst join the insurgency, and at best stop supporting the COIN effort. Skilled Soldiers know, for example, that binding a male's hands and sitting him in the corner in front of others is interpreted as grave disrespect, and retribution must be paid. They know to apologize to the male head of household for the intrusion, and to request his knowledge as a way to show him respect. They know to compensate the family as soon as possible for any property damage that was done.

(Table Continues)

2) In the context of a meeting with local officials, a skilled leader knows to anticipate what will happen in the meeting based on the power dynamics he has witnessed and his past experiences with the group of officials. He is able to apply his knowledge of recent events to predict what a local official is thinking and what sort of funding or projects requests he will make. In some cases, a skilled leader will be able to predict that the local official will attempt to gain more power. In other cases, he may predict that the official will attempt to obtain a favorable situation for his family. Despite the outrageousness of a request for funding, the skilled leader knows to keep a straight face and say that the request will be considered, so that the individual will feel fairly treated.

3) In the context of the urban patrol conducted after curfew, Soldiers must respond appropriately to situations in which someone is violating the curfew restrictions. A skilled Soldier will be aware of restrictions because of the information provided during the Battle Update and his knowledge of the neighborhood. When the Soldier unexpectedly comes upon a civilian male who is carrying a large package, the civilian instinctively turns and runs. Because he is running away, the civilian does not pose an immediate threat to the patrol. The skilled Soldier knows the rules of engagement for this type of situation. Instead of using force, he takes immediate non-threatening action by shouting "stop, I am your friend" in Arabic and avoids firing his weapon. The Soldier considers other factors and assesses why an individual would be on the streets – social commitment, crime, or returning late from a job site. He also recalls that there have been incidents of violence and crime after curfew reported recently by neighborhood leaders and the Police. The civilian immediately stops, throws the bundle to the ground, and thrusts his arms in the air while yelling something in Arabic. The skilled Soldier directs the civilian to the ground by motioning with his hands and watches carefully for any quick or suspicious movements. The civilian places himself on the ground, face down, with his hands outstretched. His hands are empty. The Soldier realizes that he has control of the situation and approaches with caution with his weapon pointed at the individual. He listens for others who may be lurking and notifies his squad leader of the detention. He does not approach the parcel. He covers the civilian until the Police arrive. The civilian provides identity papers to the Police and explains the situation, while the Soldier looks on. He makes note of key information and prepares to include it with his patrol report.

(Table Continues)

Competency 5: Adapt To The Situation

Task 1: Shift across combat and stability operations.

Condition: The Soldier is in a counterinsurgency environment. The Soldier's mission involves tasks across the full spectrum of operations, including combat, stability and support, civil-military operations, and humanitarian assistance.

Standard: Effectively adjusts level of force and responds appropriately to a new set of circumstances.

Knowledge	Skill	Ability	Attitude	Tool
▪ Lines of effort. ▪ Task, purposes, and end states for each line of effort. ▪ Cultural cues, e.g., actions that are viewed as disrespectful. ▪ Rules of engagement. ▪ Escalation of force procedures.	▪ Recognizing danger. ▪ Assessment of the nature of a threat, or the level of risk associated with a threat. ▪ Assessment of medical emergencies as being critical or non-critical. ▪ Focusing outward on the situation rather than inward on the patrol's or one's own tasks. ▪ Communication through an interpreter. ▪ Critical thinking skills to determine root cause. ▪ Coping and reasoning skills to overcome counter-productive responses (such as retaliation).	▪ Assessing situations. ▪ Managing anger, e.g., direct anger only toward insurgents. ▪ Critical thinking under pressure and stress. ▪ Flexibility to adjust stance quickly. ▪ Self-monitoring. ▪ Frame shifting and code shifting – cognitive and physical tendencies, to apply different schema depending on the current situational context.	▪ Willingness to take charge. ▪ Willingness to make decisions rapidly. ▪ Caring. ▪ Empathy. ▪ Respect to noncombatants.	▪ Interpreter. ▪ Intel packets, to identify known insurgents. ▪ Signs, to communicate to civilians.

(Table Continues)

Context Examples:

1) During a presence patrol, HUMINT collection effort, supply convoy, or other mission, Soldiers may encounter a threat from insurgents that requires them to shift into a combat mode. The threat may take the form of a detected or detonated IED, a small arms ambush, or a grenade attack. For example, insurgents may emplace a real or hoax IED in a location they believe will cause the patrol to stop in a "kill zone," or area where insurgents concealed in surrounding buildings can attack with grenades or small arms fire. In this case, Soldiers "upshift" into an aggressive stance to defeat the threat.

2) During conduct of a vehicle checkpoint, Soldiers follow formalized escalation of force procedures based on the behaviors of a vehicle's driver. Driving behaviors seen as increasingly threatening (i.e., indicative of a Suicide Vehicle-Borne IED) are accompanied by commensurate protective and aggressive actions that should be applied by the Soldiers. In this case, shifts in combat posture are dictated by the driver's behavior and an assessment of his intent.

3) During a raid or building clearing operation, Soldiers enter the building with a level of force commensurate with the suspected insurgent threat on the inside. In several cases, Soldiers find once inside the building that the targets of the raid are no longer in the building or the wrong building had been identified. In these cases, Soldiers must downshift from a very aggressive stance to a respectful and even friendly stance to collect information from the occupants and control the amount of damage done to the "hearts and minds" campaign as a result of their aggressive entry.

4) During the course of any mission, a medical emergency involving the local populace requires Soldiers to attend to the medical care of the individual.

Examples of skilled performance for the contexts above:

1) Skilled Soldiers continually Assesses Situations to determine whether there is a threat to the unit. When a threat has been identified, and especially when shots are fired or an IED detonates, they shift into full combat mode, where they implement Tactics, Techniques, and Procedures, and unit Standing Operating Procedure, to protect the unit from the threat and to fight against the threat. They continue to protect noncombatants from danger to the extent possible, even while in combat mode. Once the threat has been defeated (or has run away, as is often the case), a skilled Soldier shifts back down into a non-aggressive mode and continues with the initial mission, if appropriate. However, this downshifting may be difficult for some Soldiers. The risk associated with not effectively downshifting when the threat is mitigated is angering or even injuring noncombatants who have no involvement with the insurgency.

(Table Continues)

2) Skilled Soldiers focus outward on their situation and others at all times, as opposed to focusing inward, or "head down," when conducting a task such as setting up or running a vehicle checkpoint. By directing attention outward, Soldiers can detect and monitor potential problems earlier than their counterparts who focus inward. For example, one unit was so focused on setting up the jersey barriers and getting signs in place as part of setting up a vehicle checkpoint that they neglected to see a vehicular threat that barreled through the unit, driven by a suicide bomber. The incident resulted in two casualties to U.S. forces.

3) Skilled Soldiers who are involved in raids that target the wrong house know to immediately downshift to a friendly mode. As discussed in the first example, less skilled Soldiers can find it difficult to downshift, due to the adrenaline racing through their systems. Skilled Soldiers know to be respectful and communicate their apologies to the male head of household. When a male is present, the women should not be addressed unless suggested by the man. When a male isn't present, it is appropriate to address the female head of household. Skilled Soldiers know to use the opportunity to ask the head of household for information about the target of the raid. They also know it is very important to minimize damage to the house (e.g., get all the Soldiers out so nobody accidentally breaks a lamp), and to promise to pay for damage that is inadvertently done. They will keep their promises, and often arrange for a local contractor to fix the damage (e.g., replace the door, mend the wall).

4) An incident was related in which an arms cache was discovered in a residence. The male head of household was brought to the room. While under intense questioning, the man collapsed to the floor. The expert took action to immediately shift to medical response. He checked vital signs and recognized the symptoms of cardiac arrest. He took immediate action to resuscitate the individual, while others look on. He directed the interpreter to inform family members of the situation and bring the eldest male and female into the room. He demonstrated that he was doing everything he could to save the individual. He had his radio telephone operator (RTO) contact the company operations center to get a medical evacuation. Once the individual was evacuated, he restored order. He resumed the search and had the evidence processed by the Sensitive Site Exploitation Team. He informed the family how to contact the medical treatment facility for follow-up.

(Table Continues)

Competency 6: Solve Problems Intuitively

Task: Infer the missing pieces of a story.

Condition: The Soldier is in a counterinsurgency environment. The Soldier is collecting information and analyzing what is known to construct an understanding of why an event occurred, who perpetrated an event, or who is involved in ongoing insurgent activities.

Standard: Accurately constructed a timeline of the event in question.

Knowledge	Skill	Ability	Attitude	Tool
▪ New insurgent tactics. ▪ How to utilized knowledge portals. ▪ Commander's intent & guidance. ▪ Constraints or restrictions that bound solutions. ▪ Task, purpose, and end state for each line of effort.	▪ Assessing situations. ▪ Managing the problem solving process. ▪ Recognizing a new type of problem. ▪ Monitoring the context; looking for and recognizing cues and information. ▪ Expressing the problem in terms that are clear and understood. ▪ Obtaining agreement on the problem. ▪ Collecting information about the situation. ▪ Assessing information quality. ▪ Generating assumptions to fill information gaps. ▪ Brainstorming the problem. ▪ Using divergent thinking and deferring judgment to consider ideas. ▪ Using convergent thinking to obtain closure. ▪ Devising solutions that resolve the problem. ▪ Following through and assessing the action.	▪ Managing complexity and uncertainty. ▪ Mentally simulating solutions and end states. ▪ Mentally simulating how the situation developed up to current point in time. ▪ Inductive reasoning. ▪ Deductive reasoning.	▪ Objectivity. ▪ Thoroughness. ▪ Openness to ideas. ▪ Accepting of feedback. ▪ Team player. ▪ Inquisitiveness. ▪ Tenacity.	▪ Intelligence reports. ▪ Dossiers and target lists. ▪ Staff estimates. ▪ Field notebook. ▪ Engagement worksheets. ▪ Census data. ▪ Witness or bystander.

(Table Continues)

Context Examples:

1) During urban house clearing operations when searching for an arms cache or bomb making materials, Soldiers rely on their instincts to sniff out the "good" hiding places. Soldiers are always on the lookout for patterns which might indicate that an individual is part of an insurgent group or operating within the bomb making enterprise. This might take the form of asking, "if I were a financing a bomb maker, how would I conceal the money?" When "normal items" such as a cell phone, personal computer and loose currency in large amounts, are found during a search, they may be indicative of an IED making site or involvement of an individual in the household as part of the insurgent network.

2) During a combat patrol, Soldiers sometimes come across crime scenes, where civilians have been executed. The victims are often bound, gagged and shot in the head. When these scenes are viewed in a COIN context, one could surmise it is an act of terrorism or intimidation directed against the civil population, or some form of sectarian revenge killing. Once the site is secure, the Soldier thinks through how he will hand-off the situation to the police, deal with media coverage and re-orient his combat patrol.

3) On a continuous basis, Soldiers update their knowledge of the insurgency by reading or getting briefed on the latest intelligence reports, collecting new HUMINT from locals, and using their reasoning skills to fill in gaps in information and build a coherent story about events that have occurred.

Examples of skilled performance for the contexts above:

1) The skilled Soldier views IEDs as an enterprise that has many actors and roles. One Soldier described his experience conducting a search for an arms cache or bomb making materials. He was familiar with this house and its residents, so he spent time reviewing the S2 Packet before the search and was queued to look for more than bomb making paraphernalia. Once he saw something out of the ordinary, he knew the importance of controlling the site. He immediately secured the site and controlled all individuals who were in or around the building. He instituted a think-aloud method for analyzing what he knew and where the information gaps were. He considered how an insurgent might view the situation and drew inferences about the actions and behaviors he observed. He decided to question the senior male in the house. First, he reviewed identity documents and then began the questioning. His tone was severe and he worked through an interpreter. He advised the individual that things were suspicious and he needed explanations. He confronted him with the evidence. He looked for signs of stress or discomfort in

(Table Continues)

the subject during the tactical questioning. This skilled Soldier assessed the truthfulness of the response and looked for inconsistencies. He considered what might influence this person to provide information. He listened carefully for responses that may indicate that this person supports insurgent activities. He distinguished between defiance and fear in the responses. He resumed the search with the individual helping to point out or explain. Also, he recalled whether he had seen this type of material in other clearing operations, and used these comparisons to direct his search. He deliberately surveyed the materials and initiated evidence collection procedures. Once the evidence was collected, he documented the scene by taking photos of the male suspect along with a date and time. He expedited the processing of the intelligence to the S2. He recognized the importance and significance of any documents, electronic media, cell phones or computers and arranged for their transfer to the Joint Document Exploitation Center. He did not answer the man's cell phone or access his computer. He documented the scene and activity with photographs and written reports. The male suspect was removed from the house with his hands bound and loaded into a vehicle for questioning by trained interrogators.

2) In the case of a mass casualty crime scene, the skilled Soldier realizes that mass murder can be a highly publicized event that can undermine the state of security within a community. He quickly involves civil police agencies in the processes. He seeks rapid resolution to restore confidence in the security situation within the community. He assesses the situation and seeks explanations about cause and effect. He reasons inductively and uses his intuitive abilities to make sense of the scene and to construct a scenario of what happened. He judges the motivation for the attack based on limited information by looking at the facts and supporting evidence. He relies on mental simulation skills to understand how the incident took place. He uses his knowledge and available information to construct a reasonable timeline. He infers how the attack took place and draws conclusions about why it took place. He tests his hypotheses against the facts to draw conclusions. He canvasses the local population to determine what they know. He considers all the facts, not just the ones that fit his conclusions. He tests facts and information to determine consistency, accuracy, and usability given what he knows about the situation.

3) In the case of making sense of continuous HUMINT updates, a skilled Soldier knows to always consider the credibility of new information being provided by a frequent informant or other individual. He assesses how well he (or others from his unit) knows the source. When the source is well known and has a history of being accurate, then the information is judged to be more credible. He also knows that sometimes the U.S. forces can be set up by the insurgency to take a particular action (for example, to raid a residence that has been booby-trapped with explosives) or to believe a particular story. A skilled Soldier knows to consider the agenda and assess the trustworthiness of the person providing the information. He combines what he hears from the individual with what is known from prior sources to assess the goodness of the new information, by reasoning about whether the story "fits."

COIN Training Solutions

The results of the COIN cognitive competency analysis were provided to members of the CRFP for their recommendations of innovative yet viable training approaches for preparing our Soldiers and leaders to conduct these cognitive tasks in an operational COIN environment. The objective was to identify viable training methodologies, largely technology-supported, that are grounded in the science of learning and the science of instruction. The science of learning is the study of how people learn. The science of instruction is the study of how to help people learn (Mayer, 2008). The training methodologies considered by the U.S. Army for implementation in support of COIN cognitive competencies must be grounded in a firm empirical research base in the areas of learning and instruction. This section describes the procedure for eliciting recommendations from the CRFP members, whose efforts in the learning and instructional sciences are highly regarded, and our subsequent examination of the recommended training solutions for their feasibility as part of future U.S. Army COIN training.

Identification of Innovative Training Methodologies

Participants

Six academicians who are members of the CRFP were selected by ARI for participation:

- Dr. Jeremy Bailenson of Stanford University
- Dr. Brian Beatty of San Francisco State University
- Dr. Matthew Dunleavy of Radford University
- Dr. Charles R. Graham of Brigham Young University
- Dr. Steve W.J. Kozlowski of Michigan State University
- Dr. Richard E. Mayer of the University of California at Santa Barbara

Five of the consortium fellows were asked to select at least one of the COIN cognitive competencies identified in the analysis and prepare a short white paper describing a training solution to address the competency. Within the white paper, they were asked to discuss the research literature in support of their approach, their rationale for applying the training approach to the cognitive competency selected, the ability to generalize the approach across training audiences (i.e., Soldiers from different military occupational skills (MOSs) and various levels of proficiency), and the requirements for developing and implementing the approach as part of U.S. Army training. The sixth consortium member, Dr. Mayer, was asked to contribute as an impartial reviewer of the five white papers. His submission was a white paper that discussed the role of instructional technology in training cognitive skills, and reviewed the five training approaches in light of ARI's programmatic goals.

Following submission of the white papers, all six members were asked to participate in a telephonic roundtable discussion of the training approaches with the research team and representatives from ARI. During the roundtable, each individual had the opportunity to brief his approach, field questions from the research team and the other consortium members, and engage in a discussion of each approach. In Dr. Mayer's case, the presentation provided an overview of the instructional strategies represented by the five proposed training approaches and

comments regarding the relative advantages of each approach. The innovative approaches are summarized in Table 2.

Table 2

Five Ways to Teach COIN Cognitive Competencies (Mayer, 2008)

Learning Medium	Instructional Goal	Instructional Method
Immersive virtual reality environments.	Take others' perspective. Collaborate with others.	Interact in COIN scenarios in which the learner sees the situation from someone else's perspective; interact in COIN scenarios in which the learner sees self from a third person perspective.
Flexible hybrid environments.	Collaborate with others.	Allow learners to choose between face-to-face and online instruction.
Augmented reality simulations with mobile GPS-enabled computers.	Assess people. Assess situations.	Interact in COIN game scenarios by moving in a physical area as part of a collaborative team.
Video analysis of played-out scenarios.	Assess people. Assess situations.	Create or view annotated video of one's own or other's performance in problem scenarios as in After Action Review (AAR).
Simulation-based training or face-to-face training.	Assess situations. Solve problems intuitively. Adapt to the situation.	Interact within a game-line microworld consisting of model cases.

Following the roundtable discussion, consortium fellows completed a short questionnaire in which they were asked to rate, on a five-point Likert scale, their training method's appropriateness to each of the three specific cognitive tasks described within each cognitive competency. In addition, they were given the opportunity to offer additional comments regarding their methodology in light of the discussion that took place during the roundtable.

Recommended Training Approaches

Each consortium member presented a distinct approach to training one or more of the COIN cognitive competencies. Across the spectrum of training approaches, each of the six cognitive competencies was addressed at least once.

Immersive virtual reality. Dr. Bailenson proposed the use of Immersive Virtual Reality to train *Collaborating with Others* and *Taking Other's Perspective* (Bailenson, 2008). The Immersive Virtual Reality approach uses a digital representation system that supports individual development of assessment skills through Collaborative Virtual Environment. The training

allows the individual learner to interact with an avatar and experience another culture. It allows the individual learner to form and test expectations about the avatar based on sensed or expressed behaviors within a context. The learning environment and learning strategy are based on Transformed Social Interaction theory, suggesting that individual behaviors conform to the expectations of others.

Hybrid-Flexible (HyFlex) delivery method. Dr. Beatty presented a hybrid and flexible – HyFlex – blended training delivery mechanism for supporting *Collaborating with Others*, specifically the subtask to *Facilitate Development of Community Government* (Beatty, 2008). The HyFlex approach is an instructional theory intended to blend online and traditional classroom instructional activities. Its foundations provide for greater learner control over the content and delivery method. It also ensures that there is equivalency between methods that accommodates individual learning style and goals. The HyFlex also generates a set of re-usable learning objects that are accessible in a variety of media and forms to encourage learning. This approach seems less relevant to the training requirement because it describes a learning management system as opposed to an adaptable learning system. The proposed solution generally addressed the Learning Management aspects of the instructional strategy rather than a well-specified innovative training technique for further examination.

Augmented Reality (AR) simulations. Dr. Dunleavy proposed Augmented Reality Simulations for training *Assessing People* and *Assessing Situations* (Dunleavy, 2008). The Augmented Reality approach describes a rapidly configurable learning environment that can be tailored to the cognitive requirements for COIN missions and Soldier tasks. In this approach, a mobile, multimedia, game-like learning environment is created to allow the Soldier to experience an operating environment and practice the pattern recognition skills he is likely to use. The Augmented Reality approach leverages archived video which might reduce the cost and time requirement to create learning content. However, it points out the other front-end costs associated with simulation development would be great.

Video analysis and cognitive apprenticeship. Dr. Graham described the use of Video Analysis Tools and Cognitive Apprenticeship to train *Assessing People* and *Assessing Situations* (Graham, 2008). The Video Analysis approach employs video tagging and media annotation technology to practice and critique cognitive skills training. Video analysis and learning methods are a particularly adaptable to blended learning settings where there may be a combination of live and constructive interactions used to support training. The goal of the training solution was to allow learning to occur through cognitive apprenticeships. This approach would match domain experts with less experienced individuals as means of accelerating learning, enhancing learning transfer, and enabling improved performance through individualized feedback and analysis.

Active learning. Dr. Kozlowski described an Active Learning approach for developing competencies related to *Assessing Situations, Solving Problems Intuitively*, and *Adapting to the Situation* (Kozlowski, 2008). The Active Learning approach employs a learner-centered model for instruction and is particularly suitable for developing skills needed to perform complex, cognitively-loaded tasks. The method addresses problem solving skills when critical thinking might be required to understand the problems and to generate action scripts to resolve

uncertainty or select a course of action. Once the training developer has determined the critical skill, knowledge and abilities to be trained, they provide the bases for cognitively authentic training case development. Each case can be developed as a model of expert performance that can be used to engineer an effective solution. This training strategy offers the learner several types of performance feedback which results in significant learning transfer and generalization to similar task requirements. Several delivery media are applicable – computer-based, simulation and paper-based. This proposed solution generally addresses the theoretical underpinnings of an instructional curriculum or system rather than a well-specified training technique for further examination.

Prioritization of Innovative Training Approaches

Based on the white papers and roundtable discussions, the research team sought to rank order the training approaches for feasibility and applicability to the COIN cognitive competencies, in order to propose a subset to be considered for additional examination and proof of concept demonstration. The team evaluated four of the five proposed solutions, excepting the Active Learning approach[1], along several unweighted performance and effectiveness criteria to distinguish the suitability of the alternatives for future implementation in the Army. The following dimensions were utilized as criteria:

- Technology readiness level – the perceived maturity level of the technologies involved in the proposed training solution.
- Applicability to range of COIN cognitive competencies –the extent to which the training solution can be applied to several cognitive competencies.
- Implementation requirements – the perceived costs (i.e., instructor time, hardware, technician time) associated with executing the training solution once it has been developed.
- Applicability to range of training audiences – the extent to which the training solution can address the needs of Soldiers at a range of performance levels.
- Applicability to COIN mission requirements – the extent to which the training solution addresses the unique COIN mission context.
- Fit within Army training system – the extent to which the training solution can be smoothly integrated into the Army's existing training structures, including Army Force Generation (ARFORGEN).
- Quality of learner motivation – the perceived ability of the training solution to engage and motivate Soldiers to learn.
- Quality of performance feedback – the perceived ability of the training solution to provide Soldiers with feedback on their cognitive task performance.
- Ability to assess performance – the perceived capability within the training system to reliably assess every Soldier's performance on cognitive tasks.

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[1] The Active Learning white paper provided a valuable discussion of the learning science behind an instructional design approach for complex cognitive skills such as those relevant to COIN missions. However, a specific training solution was not delineated. Therefore the Active Learning approach was not rated for suitability to the Army's training needs.

- Theoretical underpinnings – the extent to which the training solution has been scientifically shown to result in learning.

Each of three researchers individually rated the proposed training solutions against each of the dimensions, assigning a rating of 1, 2, or 3 for "worst," "moderate," or "best," respectively. Note that a more traditional rating scheme such as low-medium-high was not appropriate, since in some cases a "low" rating was the most desirable and in other cases, a "high" rating was the most desirable. Each solution was considered independently against the products of the COIN cognitive competency analysis. The ratings of all three researchers were summed and scores were totaled across dimensions for each training solution. The analysis is summarized in the decision matrix displayed in Table 3.

Table 3

Total Rating Scores for Proposed INMASS Training Solutions

Criteria	Immersive Virtual Reality	HyFlex	Augmented Reality	Video Analysis
Technology Readiness Level.	7	9	5	6
Applicability to COIN Cognitive Competency.	6	4	7	9
Implementation Requirements.	5	7	5	7
Applicability to Training Audience.	6	4	8	8
Applicability to COIN Mission Requirements.	7	4	7	9
Fit with Army Training System.	7	3	8	9
Quality of Learner Motivation.	8	3	8	9
Quality of Performance Feedback.	5	3	7	9
Ability to Assess Performance.	5	5	7	9
Theoretical Underpinnings.	7	6	5	7
Total Score	63/90	48/90	67/90	82/90
Percent of Total	.70	.53	.74	.91

Based on these data, the Video Analysis was considered highly relevant to the COIN requirement, and these scores were consistent across the three raters. Virtual Reality and

Augmented Reality solutions also offered sufficient promise to recommend they be further investigated for their feasibility of implementation in the Army. Neither HyFlex nor Active Learning was considered suitable for the immediate COIN training requirement. The HyFlex is a learning management system that supports self-blending of learning environments (classroom versus online) to facilitate learning through student control over their own process. While HyFlex is highly regarded as an approach for university and community settings, it is not a viable tool for implementation within the Army training culture. Active Learning, in contrast, comprises a set of instructional principles derived from a solid theoretical and experimental foundation. Indeed, many of the tenets set forth by Dr. Kozlowski in his Active Learning white paper are germane to training complex cognitive tasks in the COIN environment and will be referenced as the ARI program develops. However, a specific instructional technology was not proposed as part of the Active Learning approach and therefore it is not recommended for further examination as a potential training solution.

As part of the final questionnaire after the roundtable discussion, each consortium fellow was asked to consider whether their own candidate approach was suitable for training each of the COIN cognitive competencies that were identified in the analysis. A summary of their responses is provided in Table 4.

Table 4

Assessment of Relevance to Training the Cognitive Competencies

Cognitive Competency	Immersive Virtual Reality	HyFlex	Augmented Reality	Video Analysis	Active Learning
Assess People.	High			High	Moderate
Assess Situations.				High	
Collaborate with Others.	Moderate	High	High		
Take Others' Perspective.	High			High	
Adapt to Situations.			High		Moderate
Solve Problems Intuitively.			Moderate	Moderate	Moderate

The information about relevance provided in Table 4 is consistent with the results of the research team's assessment, which considered technical and performance criteria. Video Analysis, Virtual Reality and Augmented Reality all appear highly relevant to the COIN cognitive competency areas and should be considered for further assessment.

Each of the three methodologies viewed as relevant to the COIN cognitive competencies and promising as a technique for implementation in the Army was notionally operationalized for demonstration. Drs. Bailenson, Dunleavy, and Graham, the originators of the training approaches, were retained to assist the research team in the generation of multimedia

representations of the training techniques as they might be employed in the Army. The multimedia demonstrations are appended, in DVD form, to this report.

In summary, the research team assessed that no one training solution would be adaptable to all six of the COIN cognitive competencies. Video Analysis seemed to offer the greatest potential due to its applicability to COIN cognitive competencies and tasks, and its perceived feasibility as an instructional technology tool that is grounded in learning theory and viable as a methodology within the U.S. Army's training structure. The Virtual Reality and Augmented Reality solutions also exhibited sufficient suitability for further exploration.

Multimedia Demonstration of Innovative Training Methodologies

Multimedia demonstrations of the three recommended training methods were developed as pilot approaches for Army consideration and support. The exemplars provide a detailed look at each training method and explore how it might be used to train OE specific skills.

Discussion

Our research underscored the complex nature of the COIN environment. Problem solving and decision-making performed by Soldiers required them to adopt new skills and strategies for making sense of situations that were more ambiguous, uncertain and threatening because the conditions had changed. Within these types of problem contexts, Soldiers had to rely on specialized knowledge about the situation, adapt their cognitive skills and abilities to these contexts, and bring new attitudes into play. The research mapped the COIN problem space and offered insights into how innovative training methods could be used to fill gaps in Soldier training and development. The research was organized to systematically characterize the learning requirements, to identify how and why performance was likely to breakdown, and to propose solutions to achieve progress in overcoming performance deficits.

The nature of COIN missions routinely provided opportunities for Soldiers to access and use high-level cognitive skills to solve problems. Our review of COIN literature, which came primarily from the military, suggested that as new lines of efforts were initiated Soldiers experienced conditions and situations that required them to apply high-level cognitive skills to solve problems. Many of these skills were only acquired on-the-job and over time. As a result, errors in judgment and other consequences associated with initially low proficiency levels affected mission performance adversely. The research team examined this topic in a series of focused interviews and survey instruments.

Training and experience across the six COIN competency areas would benefit Soldiers placed into a COIN context. We expanded on the findings from the literature review to understand what Soldiers believed was uniquely challenging about COIN operations and to learn how they prepared themselves for these situations. We interviewed and surveyed Soldiers with recent, relevant experiences that were representative of COIN missions and problems. Here we also found a pattern in how Soldiers responded to the class of problems that were found in COIN settings. They reported a range of solutions, not just a single approach that would work for all problems. This performance pattern was made up of specific cognitive competencies that could

be used to distinguish successful task performance. We also confirmed that the challenges were mitigated by individual proficiency with problem solving skills.

The analyses used a common training framework to synthesize the findings and to communicate them in the language of training developers. Expressions of high-level cognitive skills were not sufficient for identifying potential training solutions. A construct for defining the cognitive competencies and organizing their component parts was necessary for operationalizing the requirement and seeking innovative training solutions. The construct was made up of three dimensions for each Competency Area: 1) Systems dimension: Task, Condition, and Standard that characterized the measurable behavior, 2) Cognitive dimension: the KSAA and Tools that enabled individual actions, 3) Contextual dimension: the experiential component that facilitated guided practice and skill development.

The research team collaborated with CRFP members to elicit their innovative ideas for training the COIN cognitive competencies that had been identified. They participated on several levels including assimilating our research findings, preparing papers where their approaches were aligned with specific COIN cognitive requirements, discussing approaches in a forum, and assessing how each other's approaches might be relevant. Their inputs were valuable for creating a first-order solution space and providing a platform for practical interactive media demonstrations.

The interviews with Soldiers and leaders stressed that the COIN environment was a unique operating environment for many reasons. Problem contexts were non-traditional and involved economic, political, and information elements that added complexity to all decisions. Environmental factors like differences in cultural context, rapidly evolving mission requirements, threat factions, and access to information made problems more complicated and less solvable, particularly at lower tactical levels. The authors concluded that Soldiers require specific competencies to be able to resolve dilemmas they encounter in COIN settings. Currently, these competencies are acquired on-the-job, not through deliberate training. Deliberate training interventions for these competencies are expected to improve Soldier performance in COIN settings.

Training solutions that allow Soldiers to experience COIN dilemmas in context would be beneficial. While this research effort did not find these types of instructional approaches to be prevalent or accessible to the population interviewed and surveyed, they do exist. For example, a recently developed tool for improving bilateral communication provides a prototype training application that enables Soldiers to practice bilateral negotiation skills, which would fall under the *Collaborate with Others* cognitive competency (Hill et al., 2006). With this tool, learners gain experience preparing for a meeting in a particular cultural context, conducting the meeting and negotiating as required, and following up on actions identified during the meeting.

Another recently developed game-based instructional software suite, called UrbanSim, is designed to facilitate the development of situational understanding skills required by battalion and brigade commanders for full-spectrum operations and COIN missions (McAlinden, Durlach, Lane, Gordon, & Hart, 2008). UrbanSim addresses learning objectives related to the *Assess Situations* cognitive competency, albeit at a higher echelon of command than that investigated

here. This research effort did produce a number of new and promising concepts that could augment current COIN training or fill the gaps in training. Further examination of these approaches seems appropriate. However, we recommend that closer examination of any of the innovative training solutions proposed in this effort be preceded by a more thorough investigation of the COIN training tools recently fielded or in development, in order to prevent duplication of effort.

The use of Video Analysis Tools in conjunction with a cognitive apprenticeship instructional approach, as proposed by Dr. Graham, shows a great deal of merit as an technique for supporting the development of complex cognitive skills such as those required in COIN environments. One of the primary challenges associated with cognitive skills training is transferring knowledge and abilities that are tacit in nature to a learner. The cognitive apprenticeship approach pairs a highly proficient mentor with the learner, in an authentic performance context, so that experiential learning can take place supported by modeling and coaching by the mentor, articulation and reflection on task performance by the learner, and scaffolding from learners observing the mentor's performance to eventually completing the task independently.

For military training, cognitive apprenticeship is limited in its relevance due to a relative shortage of mentors as well as constraints on time available. However, the Video Analysis Tools proposed by Dr. Graham support an asynchronous, one mentor to many learners cognitive apprenticeship environment. Effective performance can be modeled to the learner through context-rich videos. Learners are required to articulate the knowledge, skills, abilities, and attitudes they see by annotating the video, comparing their annotations to the mentor's, and receiving feedback on their annotations. Further, learners receive feedback on their own performance through the same annotation mechanism. Tagging elements of performance through video annotation supports the complex task of making experiential knowledge explicit. We conclude that the Video Analysis Tools proposed by Dr. Graham show great promise for supporting the cognitive competencies to Assess People, Assess Situations, Take Others' Perspective, and Solve Problems Intuitively.

The Immersive Virtual Reality approach proposed by Dr. Bailenson has shown favorable outcomes in non-military domains with regard to its ability to support taking the perspective of others and produce new sets of behaviors as a result of self-modeling (e.g., Fox & Bailenson, 2008; Galinsky & Moskowitz, 2000). These same outcomes in a COIN task context would be of great value to the Army. With regard to the perspective-taking outcome, Dr. Bailenson's approach would rely on the Proteus Effect (Yee & Bailenson, 2007), where in online environments, participants have been demonstrated to conform to the stereotypes and expectations associated with the avatar he or she plays.

Perspective-taking is achieved by being placed in the role of the other whose perspective is desired. It is unclear at this stage how differences in cultural norms and values would be accounted for with this approach – the cultural dimension is of utmost importance for perspective-taking in COIN contexts – yet the Immersive Virtual Reality approach deems further examination. With regard to self-modeling, Immersive Virtual Reality can enable a learner to observe a digital likeness of them performing a behavior they have never before performed. In

the context of health and exercise, this approach has been shown to yield positive results by encouraging exercise in individuals who observed their digital likeness exercising successfully (Fox & Bailenson, 2008). Application of this effect in a COIN context might support the training of culturally appropriate gestures, respectful interactions with members of the local culture, or even calm and stability in the context of stressful situations.

The Augmented Reality approach proposed by Dr. Dunleavy leverages technology to generate training environments that are more physically and cognitively authentic than would otherwise be possible. The physical and cognitive makeup of the environment provided through the Augmented Reality technology tool is overlaid on an actual physical environment such as a training range. This approach recognizes the criticality of a rich training context incorporating authentic situational cues and factors for practicing complex decisions and judgments such as those required in COIN missions. It is intended to facilitate the development of collaborative process skills such as critical thinking, problem solving, and communicating, given a unique immersive learning environment that combines digital and physical objects (Dunleavy, Dede, & Mitchell, In Preparation; Klopfer, 2008; Squire & Klopfer, 2007). However, more research is necessary to determine the criticality of an augmented reality environment versus less expensive alternatives for training these collaborative process skills.

The Augmented Reality approach also suggests that there is a training benefit when physically intensive tasks are combined with cognitive tasks in a manner similar to what learners would experience in the real-world environment (e.g., Sibley & Etnier, 2003). However, again, additional research is required to determine the actual learning benefit of combining physical and cognitive tasks. One advantage of this approach is that Augmented Reality scenarios can be generated to produce as many task requirements and contextual elements as desired, while using the same training range again and again. Further, this approach supports training a team of Soldiers simultaneously, and thereby presents opportunities to train team tasks such as communication, coordination, and development of common ground by sharing information appropriately. The technology tools enable assessment mechanisms to be embedded within the Augmented Reality simulation, if desired, to facilitate the capture of Soldier's judgments throughout the duration of the training event as opposed to only after the event. This approach could prove quite useful for training COIN competencies such as Assessing People or Situations, and warrants further investigation.

Applying Instructional Design Principles to Advanced Technological Solutions

While the purpose of this research effort was to identify innovative training techniques enabled by technologies that constitute the current cutting edge, technology alone is not the solution. The rationale for incorporating technological advances into our training programs is to increase the efficiency of training, either by minimizing costs or decreasing the time needed to meet the training objective. However, no technology will facilitate learning without sound instructional design that is grounded in learning theory, supported by research evidence, and relevant to applied problems.

Mayer (2008) stresses in his white paper regarding the implementation of instructional technologies, that successful use of these technologies requires applying an understanding of

how people learn – the science of learning – and *how to facilitate learning* – the science of instruction. He distinguishes between technology- and learner-centered approaches to developing instructional tools. The technology-centered approach, which considers the state-of-the-art in technological capabilities as a starting point for training design, has produced disappointing outcomes time and time again (Cuban, 1986, 2001). In contrast, when designers take a learner-centered approach, focusing first on how people learn and then seeking technologies that will support those natural processes, the training outcome is more likely to result in success (Mayer, 2001, 2005).

Application issues include distinctions between instructional media and instructional methods. Instructional media are the tools used to deliver training, such as interactive multimedia, collaborative online environments, or desktop simulations. Each of the innovative training approaches identified in the course of this effort offer interesting and somewhat novel instructional media. In contrast to the media, instructional methods are the techniques or strategies utilized to prime cognitive processes in the learner, such as modeling a task, scaffolding the instruction, or providing feedback through a structured debrief (Mayer, 2008). While research in the past has sought to answer the question of which medium is optimal for training certain types of tasks, many members of the instructional design community stress that instructional methods are in fact responsible for the learning, not the media (Clark, 2001; Clark & Feldon, 2005).

Media may facilitate learning only to the extent that they support the implementation of instructional methods. In considering the value of each of the proposed training solutions, it is prudent to focus first on the instructional method proposed for the task(s) to be trained, and then consider whether the proposed medium offers a capability to enable the instructional method over and above existing training media. As is the case with any proposed solution to a problem, we also stress the importance of considering the costs associated with these innovative training solutions relative to the benefits they offer.

Conclusions and Recommendations

The U.S. Army is keenly aware of the shift in requirements to irregular warfare environments like COIN. These new contexts involve new threats and operational goals that require Soldiers to learn and adapt. They also involve working with Joint, Interagency, and Multinational teams. The development and application of tools for training and preparing Soldiers for these environments is an Army imperative.

The CRFP fellows proposed innovative training solutions that have the potential to improve the Army's training of complex cognitive skills such as those characteristic of COIN mission environments. The authors recommend these proposed solutions be taken as starting point to guide rigorous research as to the effectiveness of the instructional *methods* embedded in the proposed solutions for complex COIN cognitive skills.

Previous examinations of the training effectiveness of then-cutting edge instructional approaches have turned up less than compelling results. Hays (2005) reports a lack of strong evidence for the effectiveness of games for promoting learning, concluding (among other things)

that the training effectiveness of gaming technologies is more dependent on the instructional strategies in which they are embedded (e.g., instructor-facilitated debriefs of performance after training scenarios) than on the medium or the content of the training. O'Neil and Perez (2008) note the lack of solid empirical evidence as to whether learning outcomes are systematically achieved in gaming environments. Other research suggests that training is not effective without some degree of guidance, calling into question the usefulness of discovery learning (Kirschner, Sweller, & Clark, 2006; Mayer, 2004).

The authors recommend a responsible approach to development and assessment of the innovative training methods identified, described, and demonstrated by the INMASS research effort, to include research into the training effectiveness of the most promising methods, as well as analysis of their cost effectiveness.

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Appendix A

Literature Review of COIN Cognitive Competencies

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Performance Challenge	Skill	Knowledge	Ability	Attitude
Ambiguity of knowing when to use force, because force can improve position of enemy (Gompert, 2007, p. 1) IED Defeat (Phillips et al., 2008) "Direct local contact with…insurgents and contested populations...is needed to sense what is happening and to respond intelligently." (Gompert, 2007, p. 2) "[A]s more information becomes available through networking, those with an advantage in making sense and use of the information will…have a competitive advantage…" (Gompert, 2007, p. 7) "Understanding is not a project but a process informed by constant contact with the environment …by keen awareness of the environment." (Gompert, 2007, p. 41) "Surrounded by potential enemies and in constant danger, the Soldier is sorely tempted to respond to enemy contact by lashing out indiscriminately." (Nagle & Yingling, 2006) "The actions of Soldiers and leaders and their efforts on the ground can resonate at the strategic level in an instant." (Chiarelli & Michaelis, 2005, p. 9)	1. Sense Making	• What is typical • What is meaningful or critical • Rules of engagement (2BCT, 10th MTN DIV, 2008) • "…sensitivity to factors that affect the behavior of the insurgency and the contested population" (Gompert, 2007, p. 41) • Knowing kinship lines enables tracking of fighters. (Ricks, 2006, p. 3) • Study Arab and Iraqi history and read classic texts on insurgency. (Ricks, 2006, p. 2)	• Change detection (Phillips, et al., 2008) • Integrate intuition and reasoning in novel situations (Gompert, 2007, p. x) • Rapid familiarization (Phillips, et al., 2008) • Acquisition and use of human intelligence (Phillips, et al., 2008; 2BCT, 10th MTN DIV, 2008) • Perceptual acuity – "detecting and decoding verbal and nonverbal cues" (Kelley & Meyers, as cited in Abbe et al., 2007, p. 31) • Ability to determine objectively whether one's own stored mental models apply – to ask oneself, "Does my past experience apply or not to the situation I face?" If yes, then use intuition; if not, must use reason. (Gompert et al., 2005, p. 9). • Frame shifting and code switching-- cognitive and physical tendencies, to apply different schema depending on the current situational context (Abbe	• Motivation to learn – being a "self-directed learner" involves the ability to adapt to complex and dynamic situations. (Gompert et al., 2005, p. 21). • Patience [to acquire human intelligence] (2BCT, 10th MTN DIV, 2008) • Open-mindedness; consideration of multiple perspectives; not jumping to conclusions about what a situation means (FM 6-22, 2006)

Performance Challenge	Skill	Knowledge	Ability	Attitude
			et al.. 2007, p. 21). • Exposure to new ideas and tasks never before encountered (to stimulate novel thinking patterns) (Vandergriff, 2007, Dec, p. 50) • "Critical thinking … [being] exposed to a broad array of expertise not normally considered as part of traditional military functions will help create the capacity to rapidly shift cognitively to a new environment." (Chiarelli & Michaelis, 2005, p. 15) • Accurately identify root causes of cross-cultural conflict. (McCloskey, 2007, p. 13)	
Understand cognitive processes, mindset, values, behaviors in order to predict and communicate with members of another culture (McCloskey, 2007) Human intelligence gathering and threat determination (2BCT, 10th MTN DIV, 2008; Ross, 2008) Understand the enemy's thought processes to defeat them (Gompert, 2007, p. x). Perspective-taking (Abbe et al., 2007, p. 6).	2. Perspective Taking (This skill can be used in the process of direct interaction such as gathering intelligence, or indirect analysis such as reflection on actions, planning, Intelligence, and Information Operations. It can be used to understand enemy or to understand	• Framework for understanding other cultures (McCloskey, 2007) • Cultural knowledge, cross-cultural schema (Abbe et al., 2007, p. 5) • Human Geography (2BCT, 10th MTN DIV, 2008); Human Terrain (Gompert, 2007, p.1) • Understand the nature of the global jihad – what	• Manipulation of mental models, including prediction through mental simulation • "…anticipate correctly the results of the actions they plan to take" (Gompert, p. 6) • Rapid acquisition of specifics in area of operations: An awareness of one's own knowledge gaps;	• Willingness to be "supportive, communicative, flexible, tolerant, and open to others' views and new ideas" (Gompert et al., 2005, p. 21) • Show respect; "treat detainees respectfully" (Ricks, 2006, p. 1); concede mistakes (Ricks, 2006, p. 3) • Making concessions/

Performance Challenge	Skill	Knowledge	Ability	Attitude
"The potential for individual Soldier actions to have far-reaching, sometimes strategic, consequences highlights the need for clear conceptualization and training of cross-cultural competence." (Abbe et al, 2007, p. 2) "The inability to distinguish between insurgents and non-combatants places enormous stress on Soldiers… Close cooperation with host-nation security forces increases the ability of our Soldiers to distinguish friend from foe." (Nagl & Yingling, 2006) "Understanding the role of our actions through the eyes of the populace" and having "a clear understanding of cultural norms directly applied to our actions" was critical in the "planning, preparing, and executing of all operations." (Chiarelli & Michaelis, 2005, p. 7, 8) "Cultural mitigation" is key to COIN. "If there is nothing else done other than kill bad guys and train others to kill bad guys . . . there remains no opportunity to grow the supporter base." (Chiarelli & Michaelis, 2005, p. 9) Have a "keen understanding of demographics as well as the cultural intricacies that drive the Iraqi population" (Chiarelli & Michaelis, 2005, p. 5) "[C]o-option of the populace using	allies.)	motivates members and recruitment and actions (Gompert, 2007, p. xi) • "COIN training and education should include the study of the process by which ordinary Muslims travel the path to becoming suicide terrorists, including Islamic attitudes, ideals, and grievances, as well as consequences of using force." (Gompert, 2007, p. xii) • Gompert focuses on understanding the global jihad thought processes and not on how the U.S. Army should be prepared to address insurgencies in other locales because "[a] Rand research team has concluded that the jihad 'can and should be viewed as the first truly global insurgency.'" (2007, p. 4). • Kilcullen (2005) provides insightful discourse on this subject, reinforcing the need to understand the global jihad as the key knowledge for sense making and perspective taking.	knowledge of available resources, including online guides, experienced Soldiers, foreign nationals, and open source regional materials (McCloskey, 2007, p. 13) • Cognitive empathy (Abbe et al., 2007, p. 16) • "Temper what you know regarding military operations and a foreign culture with aspects of your own personality." (Voorhies, 2007, p. 35) • Better anticipate, manage, and prevent cross-cultural conflicts (McCloskey, 2005, p. 12) • Observation; identify cues while avoiding quick assumptions (McCloskey, 2005, p. 13) • Identify problems early (McCloskey, 2005, p, 13) • Responsive and pro-active decision-making and forecasting in the context of cross-cultural perspective-taking (McCloskey, 2005, p, 14)	admitting mistakes breaks down communication barriers. (Ricks, 2006, p. 3) • Beneficial not to view "the fight as America's war to win in Iraq, rather than Iraq's internal war the Iraqis must win for themselves." (Voorhies, 2007, p. 36). • Perspective taking in MiTT work is more effective when combined with authenticity, "be yourself" attitude" (Voorhies, 2007, p. 34) • Cultural awareness and "an empathetic understanding of the impact of Western activities on a Middle East society" (Chiarelli & Michaelis, 2005, p.9)

Performance Challenge	Skill	Knowledge	Ability	Attitude
information operations [denies] the terrorist physical and psychological sanctuary." (Chiarelli & Michaelis, 2005, p. 5) "Inaccurate or shallow assessments of others' perspectives" leads to "many instances of cultural conflicts and miscommunications." (McCloskey, 2007, p. ii) Understand the "culture of coalition," as well as the culture of those living in the theater of operations. (Glenn, 2007, p. 66) Increased interactions between military personnel and the public help COIN operations gain traction. Friendly interaction with local populations demonstrates coalition commitment, and it makes insurgents' intimidation more apparent in contrast. (Glenn, p. 9, 13)		• "…sensitivity to factors that affect the behavior of the insurgency and the contested population" (Gompert, 2007, p. 41) • Understanding motivations of Iraqis with whom you're working aids in building and maintaining rapport (Voorhies, 2007, p. 34). • "Know their history." (Voorhies, 2007, p. 33, 35) • Awareness of cultural differences beyond customs; cultural self-knowledge; dimensions of cultural difference (McCloskey, 2005, p. 13) • "In planning and execution, focus on the population, not the insurgent." (Glenn, 2007) • "Awareness of unintended intimidating effects of [one's own] actions, appearance, and language" (Glenn, 2007, p. vii)		

Performance Challenge	Skill	Knowledge	Ability	Attitude
Gain time-information edge; deal with urgent situations (Gompert, 2007, p. x) "The ability to recognize the strategic implications of their actions in a complex moral environment" (Wong, 2004, p. 11); (Avoid unintended repercussions that affect mission) Adaptability – "a competency that the Army has recognized as vital to future warfare" (Wong, 2004, p. 3). Learn to make decisions in chaotic conditions, to be mentally agile, to operate independently, take the initiative, and adapt to change (Wong, 2004, p. v). Rapid –Adaptive Decision-Making (Gompert, 2007, p. 1) Battle wisdom – the ability to decide and act in urgent, complex, high-stakes situations through well-developed mental models, self-awareness, intuition, reasoning, and leveraging of networks" (Gompert et al., 2005, p. 6). "Methods to prevent suicide attacks rely heavily on effective cognition and shorten the time from warning to decision to action." (Gompert, 2007, p. 24) "Thinking and decision-making about the use of instruments of force are more important than the capabilities of those instruments."	3. Rapid-Adaptive Decision-making	• How to manage uncertainty (Gompert, 2007, p. xii; 2BCT, 10th MTN DIV, 2008) • Mission focus; knowledge of requirements to be met • "Self-awareness" – the key to integrating intuition with reasoning, includes knowledge of one's own mental model and its limitations (Gompert et al., 2005, p. 9) • Knowledge of the domain – a conceptual understanding of the elements of tactical decision-making (Shadrick et al., 2007, p. 2) • Understand the "role of public affairs and information in warfighting" and be prepared to fight and make decisions on this level. (Glenn, 2007, p. vii)	• Predict second and third order consequences • Ability to identify, weigh and select among options (Gompert et al., 2005, pp. 9-10). • Sense making • Identification of leverage points—"…the ability to anticipate, recognize and exploit opportunities…" (Gompert, 2007, p. 48) • "Four cognitive skills are particularly important in operations: anticipation, opportunism, decision speed, and learning in action. These abilities can be put to good use in operations through rapid-adaptive decision-making." (Gompert, 2007, p. xi) • To monitor the unfolding tactical situation for unanticipated events and to determine the proper actions in response, to exploit the advantage or minimize the harm (Shadrick et al., 2007, p.2) • Ability to think independently and not rely on authority as much; ability to rely on	• Tolerance of uncertainty or ambiguity • Self-regulation/ Emotional control • Willingness to take personal responsibility for decisions (Gompert et al., 2005, p. 11, 23). • Motivation to learn – being a "self-directed learner" involves the ability to adapt to complex and dynamic situations (Gompert et al., 2005, p. 21). • Attitudes needed to support adaptive thinking and behavior: Confidence (p. 62); Willingness to take personal initiative in learning (p. 56); Willingness to use different types of information to solve a problem (p. 60; Vandergriff, 2007, Nov.).

Performance Challenge	Skill	Knowledge	Ability	Attitude
(Gompert, 2007, p. 47) "Making reasoned and timely decisions in the violent crush of warfare" (Gompert et al., 2005, p. 4). "Training techniques should be developed and used to integrate intuition and reasoning, to heighten self-awareness, and to foster adaptive decision-making under stress, urgency, and uncertainty." (Gompert, 2007, p. 54) To quickly evaluate a rapidly changing tactical situation (Shadrick et al., 2007, p. v). Adaptive Thinking – a key component of competency in battle command – is the type of thinking a leader "must do to adapt operations to the requirements of unfolding events…. Expert adaptive thinking under stressful performance conditions requires considerable training and extensive practice in realistic tactical situations until thinking processes become largely automatic." (Shadrick et al., 2007, p. 2) Using the ALC model of learning and training, instructors teach "leaders how to think rather than what to think" – develop adaptability through rapid decision-making process using experiential learning model (Vandergriff, 2007, Nov., p. 60).			own intuition and engage in reflective thinking (Vandergriff, 2007, Nov, p. 66) • Strength of character and self awareness (Vandergriff, 2007, Nov, p. 62) • Skills needed to support adaptive thinking and action: Listening skills; Cognitive skills (p. 59); Communication skills; Pattern recognition skills (p. 56); Problem-solving skills (p. 58); Decision-making skills (p. 60); Critical-thinking skills, including logic – inductive and deductive reasoning skills (Vandergriff, 2007, Dec., p. 62) • General abilities needed for adaptive thinking and action: Ability to learn, assess, and evaluate (p. 49); Ability to be open to rethinking judgments (p. 62) (Vandergriff, 2007, Dec)	

Performance Challenge	Skill	Knowledge	Ability	Attitude
Necessary for leaders to be adaptive because war is a "complex and open environment," requiring continuation adaptation to changing circumstances (Vandergriff, 2007, Nov., p. 62). Preparing leaders ahead of time to deal with the stress of combat in the shortest amount of time (Vandergriff, 2007, Dec) "Failed COIN operations are the legacy of those unable to restrain themselves [from using inappropriate force]." (Glenn, 2007, p. 16)				
"Better cognitive abilities must not be concentrated among 'the few' at the center but instead spread across 'the many' in the field, who must, in turn, have unobstructed access to information, the authority to act, and the chance to collaborate horizontally without deferring to a higher authority." (Gompert, 2007, p. xii). "Distributed information is most potent when decision-making is also distributed." (Gompert, 2007, p. 3) "By making fresh information readily available, information networking can reduce dependence on experience-based intuition." (Gompert, 2007, p. 36) "…networked, small units are often the best way to operate against scattered enemies… Success	4. Continuous and Collaborative Horizontal Information Use and Decision-making (Must be supported by changes in doctrine and technology)	• "…informed through shared purpose and strategy" (Gompert, 2007, p. 3) • With good Information Management [IM] in place, "a battle-wise officer is trained to know what information to pull from the network." (Gompert et al., 2005, p. 7).	• Reach for knowledge/pull information—"It is striking how little U.S. operating elements have benefited from the revolution in 'user-reach' information networking…" (Gompert, 2007, p. 48)	

Performance Challenge	Skill	Knowledge	Ability	Attitude
depends not only on the ability of such units to acquire and share information but also on how well and how fast they process it." (Gompert, 2007, p. 38)				
"[A]s more information becomes available through networking, those with an advantage in making sense and use of the information will…have a competitive advantage…" (Gompert, 2007, p. 7)				
Other local coalition organizations are rich sources of intelligence, but leadership must know to ask. (Voorhies, 2007, p. 38)				
Sharing information with other coalition organizations in your area helps them "build better intelligence networks" and, in turn, makes them more likely to share their information with you, aiding in understanding the location and intent of the enemy. (Voorhies, 2007, p. 38)				
"Procedures for obtaining release of materials are often too lethargic to meet tactical demands." (Glenn, 2007, p. 80)				
Over-centralization due to over-caution cripples IO effectiveness. (Glenn, 2007, p. 80)				
There is a need for training and doctrine "to allow seizure of initiative and to adapt command and control procedures as necessary." (Glenn, 2007, p. 81)				

Performance Challenge	Skill	Knowledge	Ability	Attitude
"Unity of effort: Integrating Civilian and military activities" (DA, 2006 [FM 3-24, Chapter 2]) "Developing Host-Nation Security Forces" (FM 3-24, Chapter 6) Collaboration is the enemy of the insurgent (2BCT, 10th MTN DIV, 2008) "Shaping is largely about discrediting the narrative of the adversary in the eyes of the contested population." (Gompert, 2007, p. 46) "Building interpersonal relationships across cultural boundaries has implications for overall mission success, even after the particular individual has left the area of operations, and personal adjustment outcomes may have implications for the organization's ability to retain and further develop individual leaders." (Abbe et al.. 2007, p. 2) "Successful military negotiations are critical to ensure effective completion of peaceful missions such as nation building as well as for collecting intelligence and building the local support necessary to succeed in fighting insurgents." (Nobel et al., 2007, p. 25) Working closely with NGOs and local government to foster agricultural opportunity and economic independence leads to	5. Create and Sustain Collaborative Actions Across Agencies and Groups (Such as Iraqi Army or Police training and procedures, development of new agencies or organizations, ways for existing agencies to interact, Concerned Citizen security organization, or any number of reconstruction actions)	• Knowledge of organizational and political players (Shadrick et al., 2007, "Big Picture" and 2BCT, 10th MTN DIV, 2008; Human Geography) • Knowledge of COIN; peace-keeping; stability/support missions, nation-building (Nobel et al., 2007, p. 25). • All operators must understand civil-military strategy (Gompert, 2007, p. 58) • To support negotiation skill learn about: mediation processes; non-Western and Middle Eastern cultural values and norms; clear organizational policies and direction regarding deviating from rules; the value of building relationships with multiple members of the community; cross-cultural awareness about time and causal attribution differences, as well as structure and values of social harmony and hierarchy and other cultural differences; the	• Perspective taking • Basic & Cross-Cultural Negotiation Skills – "central competency of military leadership" (Noble et al., 2007, p. 25) includes effective mediation skills; basic project management skills; "negotiation communication training focusing on the use of verbal and nonverbal communication to project power, confidence and domination with regard to specific issues while expressing politeness, deference and respect to the person;" how to increase trust and manage distrust; how to use self-reflection to foster on-the-job learning from experience (Nobel et al., 2007, pp. 16-17). • Persuasion/Influence (2BCT, 10th MTN DIV, 2008) • Rapport building (Ross, 2008) • Relationship building (Ross, 2008; 2BCT, 10th MTN DIV, 2008) • A culturally flexible individual may be able to	• Willingness to be "supportive, communicative, flexible, tolerant, and open to others' views and new ideas" (Gompert et al., 2005, p. 21). • Resilience to setbacks; willing to take risks (FM 6-22) • Willingness "to live with unpredictability" and "to adapt to the situation when it changes or emerges differently from what they expected" (Wong, 2004, pp. 12-13) • Cognitive Control, Emotional Control, and Mental Readiness (Thompson & McCreary, 2006). • Social initiative or willingness to communicate when in cross-cultural setting (Abbe et al., 2007, p. 16) • Empathy (Abbe et al., 2007, p. 5) • "Every time you treat an Iraqi disrespectfully, you are working for the enemy." (Ricks, 2006, p. 1) • Making concessions/admitting

Performance Challenge	Skill	Knowledge	Ability	Attitude
stability. (Chiarelli & Michaelis, 2005, p. 14) "Winning the competition for popular support" is identified as one of the six major "key challenges" in COIN. (Glenn, 2007, p. viii)		power disparity in negotiations; tactical techniques; negotiation research on concession strategies, the impact of negative emotions on negotiations, and techniques to regulate emotions. (Nobel et al., 2007, pp. 16-17) • "Awareness of unintended intimidating effects of [one's own] actions, appearance, and language." (Glenn, 2007, p. viii)	express emotions either directly or indirectly and will situationally adapt expression in response to shifts in cultural frames. (Abbe et al., 2007, p. 21) • Flexibility (Abbe et al., 2007, p. 5 & p. 20; Ross, 2008) • Adaptability: • Self-monitoring (Abbe et al., 2007, p. 6) • Emotional regulation (Abbe et al., 2007, p. 5) • Establish common goals (Ross, 2008) including safety and security (2BCT, 10th MTN DIV, 2008) • Create confidence (2BCT, 10th MTN DIV, 2008) • Coping, stress management (Abbe et al., 2007, p. 5). • Manage need for closure; tolerate ambiguity (Abbe et al., 2007, p. 6) • To build a "richer and deeper understanding of alternative world views." Also, knowledge and social judgment are taught in ALC, but it's more about "learning	mistakes breaks down communication barriers. (Ricks, 2006, p. 3) • Demonstrate a desire to help, which builds rapport (Voorhies, 2007, p. 34) • Show willingness to share hardships with Iraqis (in MiTT context). (Voorhies, 2007, p. 35)

Performance Challenge	Skill	Knowledge	Ability	Attitude
			how to learn" – a process-oriented cognitive approach. (Vandergriff, 2007, Nov, p. 66)	
"Operate along all five Lines of Operation simultaneously" (2BCT, 10th MTN DIV, 2008) Learning complex and changing roles—"You are not just trying to learn one job, you are trying to learn several dozen jobs. Everything from being a politician to being a war commander. That is just an incredible amount of information for someone to carry around in their head." (Wong, 2004, p. 4) "A British veteran of recent operations in Iraq has noted that the U.S. Army is too inclined toward offensive operations…" (Gompert, 2007, p. 49) "Surrounded by potential enemies and in constant danger, the Soldier is sorely tempted to respond to enemy contact by lashing out indiscriminately." (Nagle & Yingling, 2006) Cognitive Control, Emotional Control, and Mental Readiness--Stressors (in military contexts) reduce operational effectiveness by impairing attention and short-term memory, narrowing focus, and biasing information processing – leading to errors in judgment and performance. Traditional training	6. Shift Across Requirements of Full-Spectrum Operations	• Understand the purpose of different lines of operation • Understand coping strategies for moving from high intensity, dangerous situations to other types of tasks and back	• Coping and reasoning skills to overcome counter-productive responses (such as retaliation) (Ross, 2008) • Flexibility--"In addition to the complexity caused by the multiple roles of junior officers in OIF, [we have] what several officers called "the faucet" or the necessity of adjusting to situations that could change from cold to hot and back to cold instantaneously". . . "You got to deal with a little girl who wants a chem light and the very next minute might have to shoot somebody for trying to place an IED . . It is such a switch." (Wong, 2004, p. 5). • Self-regulation • Self-monitoring (Abbe et al., 2007, p. 6)	• Mental Agility – willingness to take on additional duties or to shift roles constantly (Wong, 2004, p. 6) • Show respect; "treat detainees respectfully" (p. 1); concede mistakes (Ricks, 2006, p. 3)

Performance Challenge	Skill	Knowledge	Ability	Attitude
used by the military for teaching stress management brings up stigmas and stereotypes regarding mental "weaknesses" in the military culture, and is seen as irrelevant. (Thompson & McCreary, 2006)				
Operational success depends on "the net effect of many microdecisive actions performed along all interconnected lines of operation." (Chiarelli & Michaelis, p. 16)				
"Our own [military] regulations, bureaucratic processes, staff relationships, and culture complicate the ability of our Soldiers and leaders to achieve synchronized nonlethal effects across the battlespace." (Chiarelli & Michaelis, 2005, p. 15)				
Many Soldiers' missions span "the full spectrum of combat, stability support, disaster relief, and civil-military operations," encountering daily communication differences. (McCloskey, 2007, pp. 1-2)				

Appendix B

KSAA Analysis Interview Protocol

I. Purpose

The purpose of this interview is to improve Soldier training. There are three goals:

1) To understand the broad tasks, performance areas, or job roles required for success in COIN, from the perspective of military SMEs who have recently returned from theater. (During data analysis, these will be related back to the Skill Areas identified in the literature.)
2) To uncover unique insights from military SMEs regarding how they have addressed operational challenges specific to COIN.
3) To obtain feedback from military SMEs on the Skill Areas identified in the literature, to determine whether the Skill Areas a) resonate with the SMEs based on their experiences, and b) can be elaborated by understanding the nature of the Skill Area, the conditions in which it applies, and the difficulties related to its performance in the context of actual operational events.

II. Background and Demographics

Provide a brief overview of the purpose of this project and the expectations we have for the role of the interview participant:

- *The purpose of this project is to identify some new ways of training the complex skills that are required for COIN operations.*
- *We'd like to hear about your experiences in your recent deployment(s) so we can understand how you've learned to be successful in a COIN environment.*
- *We expect to talk with you for about two hours. Is that all right with you?*
- *Do you have any questions about our project or about this interview?*
- *We would like to record this interview so that we do not misrepresent what you tell us. We will only use the recording within our project team, and your comments will remain anonymous. Is that all right with you?*

Ask the following demographics questions. The information will be transferred to a demographics form during data reduction.

- *What is your MOS or branch?*
- *What is your rank, and how long have you served in the Army (or other armed forces)?*
- *What are the dates and location of your last deployment?*
- *What was your job while you were there? What was your mission?*
- *Was that your job throughout your deployment, or did it ever change?*
- *Were you deployed previously? If yes, repeat previous three bullets.*

III. Task Diagram

To understand the nature of the performance challenges the participant may have encountered during their deployment, construct a Task Diagram. This exercise helps us understand which job

experiences are most challenging and potentially fruitful to probe for examples. Spend no more than 15 minutes on this exercise.

Specifically, we are interested in how the participant characterizes the job as it was actually done, not in how the doctrine or other guidance prescribes the job is to be done. The purpose of the Task Diagram is to understand: What are the major parts of the job? What parts of the job are most demanding or cognitively challenging? What parts of the job are not adequately addressed by current training?

With a piece of paper or a white board in front of them, tell the participant: *We would like a general idea of what your duties consisted of while you were deployed this last time.* Ask the participant: *What were the 3-6 major tasks or activities that you performed in your COIN mission? I will draw 3-6 circles and each one will represent a major component of your job. We will ask you to give us a label for each component, and then we will ask you to help us generate a few bullets in each circle to describe that aspect of your job. If the major components are dependent on each other OR occur in chronological order, help us indicate that with arrows.* After this portion of the Task Diagram is finished, ask the participant:

- *Which of the major components did you find to be the most critical to the success of your mission?* For the task(s) identified, *Why was this critical?*
- *Which of the major components did you NOT feel prepared to take on when you first arrived in theater?* For the task(s) identified, *What part(s) of this task did you feel unprepared to do?* And *Were there parts of this task that you had to figure out, to learn to do, as you went along? Did you devise some special TTP or new ways of doing business as a result of what you were learning on the ground?*

IV. Examples of Novel COIN TTP

In this portion of the interview, we will probe for examples of novel techniques or methods that were developed as a result of experience, trial and error, or creative thinking. We will take a Knowledge Audit approach in order to elicit a collection of examples. The number of examples collected across the range of categories below will depend on a) the richness of the events described to us with regard to creative COIN strategies, and b) the time it takes to explore each example provided.

Topic Area 1. If there was a component of the Task Diagram that was identified as an area for which new techniques or strategies were developed as a result of in-theater experience, pursue that component as the first topic area to probe about the novel strategy. If not, if there was a component of the Task Diagram that was identified as BOTH critical and an area for which the participant did not feel adequately prepared, use that component as the first topic area to probe. Say to the participant, *You told us that [Task X] was a part of your job critical to your mission, and that you didn't feel adequately prepared to take it on when you arrived in theater. With regard to that task area,*

- *Can you think of an example of how you or your unit changed your approach to doing this task while you were deployed? Perhaps you figured out as you went that there was a better way to "do business?"*
- *Can you think of an example of how you or your unit did this differently than other people or other units?*
- *Can you think of an example of something new that you or your unit started doing that made you more successful?*

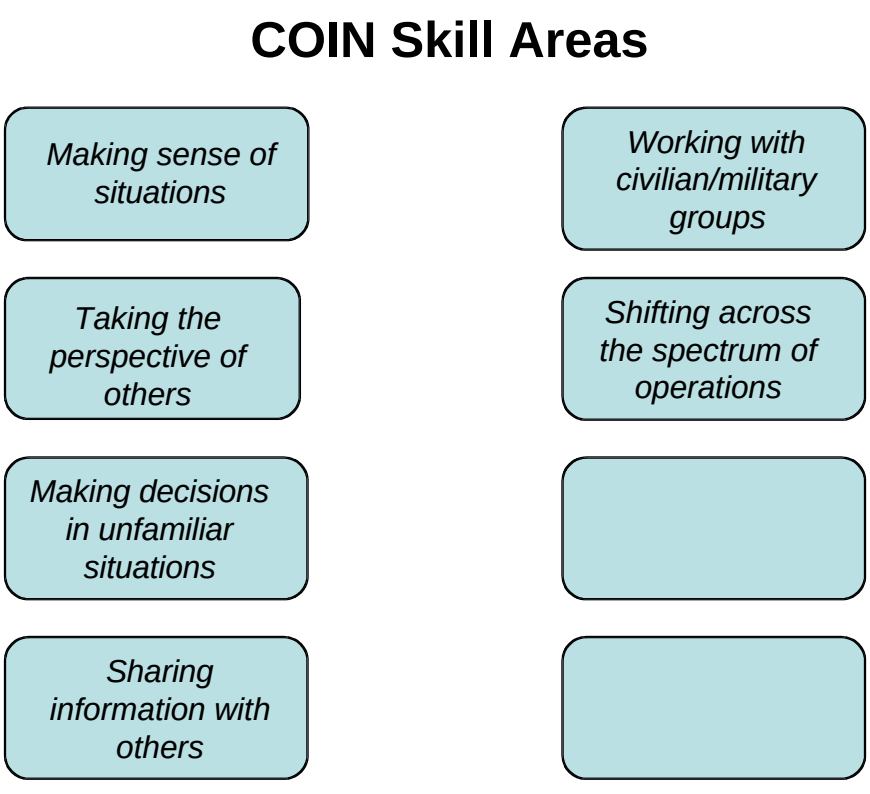
For each example that is identified by the participant, ask:

- *What was different about this new or alternative approach?*
- *How did you (or your unit) think of, or discover, this new approach?*
- *What was the reason for this new approach? How did you realize that you needed to change what you were doing?*
- *Did you tweak this approach at all over time, or did it work successfully from the first time you implemented it?*
- *How would you explain this new approach to other Soldiers about to deploy?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

If there was a second or third major component from the Task Diagram that was identified as both critical and an area for which the participant felt ill-prepared, repeat the above question sets for each component.

[Topic Areas 2-7 are intended to probe for examples and innovative strategies within the six Skill Areas identified in the literature review. Use the graphic shown here (printed on a separate sheet of paper) to show the participant the Skill Areas identified in the literature review. Provide a brief verbal description of each Skill Area. Ask the participant if any of the Skill Areas resonate as areas that were especially critical during his/her deployment. Say, for example: *These are six general skills that military SMEs and military researchers are writing about as critical for COIN*



operations. Based on your own personal experience, do these look like critical skill areas to you? Which of these skills were especially important to you and your unit when you were deployed? Are there any other important skills you would add to our list? Proceed to the Topic Areas below that correspond to the skills identified by the participant as critical to his/her mission.

If the graphic does not assist in narrowing to the most relevant Topic Areas to pursue, use the participant's responses from the Task Diagram and Topic Area 1 to anticipate which of the Skill Areas might be most relevant to his/her experience, and follow the lines of questioning for those corresponding Topics first. If it is not possible to anticipate which Skill Areas are most relevant to the participant's experience, then follow the Topics in order, BUT vary the order of Topic Areas across the interviews in order to elicit data around each area equally, to the extent possible.]

Topic Area 2. Use the **Sensemaking** Skill as the basis for this line of questioning. Say to the participant, *One of the areas that we've read about as being important in COIN operations is the ability to read the situation and make sense of what's going on around you, including knowing what a "normal" situation looks like so that you can judge whether the situation you're in is "abnormal" in some way. Is this ability something that you found to be especially critical during your deployment? Is it something that you think Soldiers has a hard time with, or need to be better at to be successful?* If the participant indicates resonance with this Sense-Making skill as an important and challenging area, then probe for an example from the participant's experience:

- *Can you think of a time when you or your unit did a good job at reading a situation that many other Soldiers would've found to be confusing?*
- *Can you think of a time when you or your unit picked up on some key element of a situation that no one else noticed?*
- *Can you think of a time when your unit did a better job of understanding a population (insurgent or noncombatant) than others had done?*

For each example that is identified by the participant, ask, as appropriately:

- *What was it that you saw differently?*
- *What were you paying attention to in order to "figure out" the most important component(s) of the situation?*
- *What were the key indicators that stood out to you? How did you go about "seeing" those key indicators? Were they immediately evident, or did you have to do something in order to discover them?*
- *Did you know to pay attention to those particular indicators? If so, how?*
- *How would you explain your skill in this area to other Soldiers about to deploy?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

Topic Area 3. Use the **Perspective-Taking** Skill as the basis for this line of questioning. Say to the participant, *Another area we've heard about as being important in COIN operations is the*

idea of thinking like or seeing through the eyes of the insurgents, OR even seeing through the eyes of the local population; understanding their processes or how they see the world so that you can make better decisions. Is that something that you felt was important for your mission success? If the participant indicates resonance with this Perspective-Taking skill as an important and challenging area, then probe for an example from the participant's experience:

- *Did you get better at thinking like the insurgents/locals over time? Can you give me an example that helps me understand what you did differently in this area toward the end of your deployment compared with the beginning of your deployment?*
- *What are some of the mistakes either you made, or you saw someone else make, with regard to understanding the insurgents or the locals?*
- *What's a situation in which you'd need to understand how the insurgents/locals see the world in order to be successful?*

For each example that is identified by the participant, ask, as appropriate:

- *What was it that you did differently? OR What were the mistakes that you or someone else made and what could have been done differently?*
- *What did you learn about the culture, or the insurgent network, or the local populace that helped you do a better job of understanding their perspective? How did you learn that?*
- *What were you paying attention to in order to "figure out" how someone else was viewing the situation?*
- *Presumably you got better over time at understanding the insurgents'/locals' perspectives. Can you tell us what strategies you used to improve your understanding?*
- *How would you explain your skill in this area to another Soldier about to deploy?*
- *If this ability to think like the insurgent or think like the locals was to be improved through training, what specifically should the training help Soldiers learn to do?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

Topic Area 4. Use the **Rapid Decision Making** Skill as the basis for this line of questioning. Say to the participant, *It's our understanding that one of the reasons COIN operations are challenging is that there are so many new situations that Soldiers run into. We know that in general, people tend to make good decisions when they're faced with a situation that they've been in before, or that is similar to their past experiences. They can use their intuition to quickly figure out what is going on and then act appropriately. But what happens when Soldiers are in novel situations for which they have no frame of reference? Was this an issue for you and your unit during your last deployment? Is this a critical skill for Army training to address – the ability to analyze situations that are unfamiliar or never before encountered?* If the participant indicates resonance with this skill as an important and challenging area, then probe for an example from the participant's experience:

- *Can you think of a time when you were successful at handling a situation that you'd never really encountered before?*

- *Were there strategies that you tried to pass down to other Soldiers in the unit to help them respond to novel situations? Can you tell us about when those strategies were used?*

For each example that is identified by the participant, ask, as appropriate:

- *What was novel or unfamiliar about the situation?*
- *What was it that you did differently?*
- *What were you paying attention to in order to "figure out" the crux of the situation?*
- *What were the key indicators that stood out to you? How did you go about "seeing" those key indicators? Were they immediately evident, or did you have to do something in order for them to be revealed?*
- *How did you know to pay attention to those particular indicators?*
- *How would you explain your skill in this area to other Soldiers about to deploy?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

Topic Area 5. Use the **Information Sharing** Skill as the basis for this line of questioning. Say to the participant, *One of the hallmarks of COIN operations is that the actions of Soldiers at the lowest echelons can have a major impact on the operation. Some believe that it's therefore critical to make the latest information and analysis available continuously, down to the small unit level, and to also give small units the ability to collaborate with each other horizontally without having to defer to a higher authority. Was this notion of pushing information down to the small unit level, and empowering them to make informed decisions, important to your mission? Was this something that your unit put a great deal of effort into?* If the participant indicates resonance with this skill as an important and challenging area, then probe for an example from the participant's experience:

- *Were there ways in which your unit learned how to get the right information down to the individual Soldiers on the ground? Can you give me an example of how you were successful?*
- *Did you have a process that was different from other units for making sure every individual Soldier had what was needed to do the "right" thing, in accordance with the mission goals?*

For each example that is identified by the participant, ask, as appropriate:

- *What was it that you did differently?*
- *Did you refine your approach over time, and if so, how and why?*
- *What were the characteristics of the individuals who did this well? What did they know and what could they do that others couldn't? We're interested in hearing about characteristics of both Soldiers at the small unit levels who are using the information, and staff members or others at higher echelons who pushed information down.*
- *How would you explain this approach to other units about to deploy?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

Topic Area 6. Use the **Civil/Military Collaborating** Skill as the basis for this line of questioning. Say to the participant, *It's our understanding that COIN operations in Iraq often involve Army units collaborating with civilian agencies or groups, the Iraqi Army, and the Iraqi Police, in order to counter insurgent activities amongst the population. Was that the case for your unit?* If the participant indicates resonance with this skill as an important area, then probe for an example from the participant's experience:

- *Can you think of an example of how you had to adapt to the way these other agencies or Iraqi forces did business, in order to be successful in your collaboration with them?*
- *Can you think of an example of how you learned to team with the Iraqi forces or a civilian agency in order to be successful or improve your effectiveness?*

For each example identified by the participant, ask, as appropriate:

- *What was difficult for you or the unit to understand about the agency or Iraqi unit when you first began working with them?*
- *What did you do or figure out in order to better understand how to leverage your relationship or association with them?*
- *What "best practices" did you devise regarding either operating with the Iraqi unit, or collaborating and communicating with the unit or agency?*
- *What would you teach Soldiers about to deploy about how to best utilize the civilian agencies or Iraqi forces in order to meet mission goals?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

Topic Area 7. Use the **Mission Shifting** Skill as the basis for this line of questioning. Say to the participant, *one of the unique features of a COIN mission is the requirement to rapidly change mindset and activities from combat to humanitarian to peacekeeping to policing all within the same operation. We're interested in whether this was something you experienced – the requirement to shift back and forth between different kinds of objectives or activities – and whether it was an area that your unit got good at over time.*

- *Can you think of a time when you were able to predict that you'd have to shift from one line of operation to another?*
- *Can you think of a time when you were challenged, or you saw someone else have a hard time, with shifting your mindset from one line of operation to another, or knowing WHEN to shift your mindset?*
- *Can you give us an example of how your unit figured out a new approach or new strategy for shifting fluidly between different sets of requirements or activities that were associated with different lines of operation?*
- *Can you tell us about some of the challenges involved in shifting back and forth across requirements?*

For each example that is identified by the participant, ask, as appropriate:

- *What were you paying attention to in order to predict that you'd have to shift your mindset and activities? OR What tips you off that it's time to devote your attention to a different line of operation?*
- *How did you get better over time at knowing WHEN to switch from one line to another?*
- *What were some of the mistakes you saw less-experienced Soldiers making with regard to shifting back and forth?*

Continue to probe on examples that seem to reveal new knowledge, new strategies, or other new ways of doing business.

V. Wrap-Up

- Now that you have a better idea of the kinds of information we're looking for, are there any other topic areas that you'd like to tell us about?
- Do you have any questions of us?
- Thank you very much for your time.