MIPB

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Critical Thinking

From the Editor

This issue is the result of collaboration with the Office of the Dean of the 111th Military Intelligence (MI) Brigade to tell our readers about the efforts the U.S. Army Intelligence Center is undertaking to ensure its students are trained in critical thinking and problem solving skills so critical to operations in the asymmetrical environment. The following comments are from Dr. George A. Van Otten, Dean of Training, 111th MI Brigade, who is the co-editor of this issue of ***MIPB***.

Sterilla A. Smith
Editor

This issue of MIPB focuses on the integration of critical thinking and scientific inquiry throughout the military intelligence curricula. Over the past several years, various commanders and leaders within the U.S. Army Intelligence Center (USAIC) have identified the need for the enhancement of critical thinking training in all military intelligence occupational specialty courses. Among them are Colonel Thomas M. Kelley, Commander of the 111th MI Brigade from June 2004 through June 2006 and Mr. Jerry V. Proctor (SES), Deputy Commandant, Futures, USAIC. As a result of their support and encouragement, the Office of the Dean, 111th MI Brigade produced a White Paper on critical thinking that is the centerpiece of this issue. The Dean's Office also developed a lesson plan that can be used to teach the basics of critical thinking as well as the foundational educational theory behind it. This issue also contains supporting articles on critical thinking from other USAIC entities by Ms. Debra Spohn, Director of the Quality Assurance Office; Chief Warrant Officer Three William McGuyer, Training Development and Support Division; Ms. Joann Kiyabu, Staff and Faculty Development Division; Mr. George Stemler, 309th MI Battalion, and Major James Reed, OIC of the Joint Intelligence-Combat Training Center.

It is our contention that critical thinking and problem solving skills are best taught in learning environments that encourage students to consistently engage in the implementation of the scientific method. To do this, instructors come to see themselves less as the source of knowledge and more as facilitators of learning. Although most courses within USAIC include practical exercises, many continue to include hours of lecture, followed by objective tests. Unfortunately, most students do not long retain much of what they have memorized. Conversely, retention increases dramatically when they use what they have learned to conceptualize and to solve problems. Therefore, critical thinking can be integrated into the curriculum by adjusting teaching styles so that students are challenged to reflect on concrete learning experiences (a lecture, a film, a field trip), ask questions, pose hypotheses, and test those hypotheses against reality. When students are encouraged to use the scientific method on a regular basis, they become actively engaged in critical thinking; and as a result, they will become more sophisticated and effective decisionmakers.

We hope the content of this issue of the MIPB stimulates the implementation of critical thinking throughout the curriculum as we sincerely believe that the contemporary operational environment demands soldiers (at all levels) who possess a keen sense of problem and robust critical thinking skills. We welcome your input and questions and appreciate the time you have dedicated to reading the materials contained within the following pages.

—George A. VanOtten, PhD
Dean, 111th MI Brigade

MILITARY INTELLIGENCE

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Purpose: The U.S. Army Intelligence Center and Fort Huachuca (USAIC&FH) publishes the ***Military Intelligence Professional Bulletin*** (**MIPB**) quarterly under the provisions of ***AR 25-30***. ***MIPB*** presents information designed to keep intelligence professionals informed of current and emerging developments within the field and provides an open forum in which ideas; concepts; tactics, techniques, and procedures; historical perspectives; problems and solutions, etc., can be exchanged and discussed for purposes of professional development.

Disclaimer: Views expressed are those of the authors and not those of the Department of Defense or its elements. The contents do not necessarily reflect official U.S. Army positions and do not change or supersede information in any other U.S. Army publications.

FEATURES

5 **Teaching Critical Thinking Skills Across the USAIC Curriculum**
by George A. Van Otten, PhD and Leon Leszcsynski, MA

15 **Integrating Critical Thinking in Classroom Instruction**
by Mr. Leon P. Leszczynski and George A. Van Otten, PhD

18 **Training Critical Thinking at USAIC**
by Chief Warrant Officer Three William N. McGuyer

22 **Evaluating Critical Thinking in the Classroom**
by the Fort Huachuca Quality Assurance Office

24 **The USAIC Instructor Training Course**
by Joann Kiyabu

26 **Employing Critical Thinking Skills in the USAIC JI-CTC**
by Major James W. Reed

28 **The Automated Systems Approach to Training Goes Lean**
by Mr. George Stemler

33 **The Army Intelligence Comprehensive Analysis Tool**
by Mr. Wesley M. Good (Master Sergeant, U.S. Army, Retired)

36 **Critical Thinking for the Military Professional**
by Colonel W. Michael Guillot, USAF

46 **Critical Thinking and Intelligence Analysis**
by Mr. Michael Brake

DEPARTMENTS

2 **Always Out Front**
3 **CSM Forum**
47 **Training the Corps**
49 **Doctrine Corner**
51 **Intelligence Philatelic Vignettes**
52 **Contact and Article Submission Information**
Inside Back Cover
A Checklist for Critical Thinking

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Always Out Front

by Major General Barbara G. Fast
Commanding General, U.S. Army Intelligence Center and Fort Huachuca

I am pleased to announce the publication and implementation of the Army's new Human Intelligence (HUMINT) field manual, **FM 2-22.3, Human Intelligence Collector Operations**, which replaces FM 34-52, Intelligence Interrogation, dated 28 September 1992. FM 2-22.3 was approved by Doctor Stephen A. Cambone, The Under Secretary of Defense Director for Intelligence (USD-I), on 31 August 2006 and was publicly announced for release on 6 September 2006. FM 2-22.3, Human Intelligence Collector Operations is available to authorized users of AKO by accessing the Reimer Digital Library (http://www.adtdl.army.mil).

FM 2-22.3 is a comprehensive publication that covers the entire spectrum of HUMINT collection activities: Screening, Interrogation, Debriefing, Liaison Operations and Human Source Contact Operations. The manual includes lessons learned from Operations Enduring Freedom and Iraqi Freedom and is designed to ensure that all HUMINT collection, including interrogations, is conducted professionally, and that all detainees, regardless of status, are treated humanely.

FM 2-22.3 applies to every Department of Defense (DOD) interrogator–DOD personnel, including contractors–as well as to military commanders and their staffs responsible for the planning, oversight, and conduct of interrogations of detainees "in the custody or under the effective control of the DOD or under detention in a DOD facility." The FM also applies to other government agencies and foreign governments conducting approved interrogations in a DOD controlled facility.

Recent policy and legal decisions have affected the HUMINT field, and consequently, the contents of FM 2-22.3. Those events were the passage of the Detainee Treatment Act of 2005 into Public Law 195-140 (also known as the McCain Amendment), and the DOD-directed introduction of the Military Source Operations (MSO) concept. Additionally, the manual complies with and implements a number of important policy documents to include DOD Directive 3115.09, DOD Intelligence Interrogations, Detainee Debriefings, and Tactical Questioning published 3 November 2005.

The McCain Amendment requires that all persons detained by the U.S. government be treated in accordance with the provisions of FM 2-22.3. This means that FM 2-22.3 carries the weight of U.S. policy, as it relates to interrogation approaches and techniques. The new FM presents carefully crafted legal guidance on everything from the proper treatment of detainees to recognizing, preventing, and reporting prohibited acts. The legal material included in FM 2-22.3 has been provided, and reviewed, by lawyers from the U.S Army Intelligence Center (USAIC), the Judge Advocate General School, the U.S. Army Office of the Judge Advocate General, and lawyers from the Office of the Secretary of Defense and the other armed services.

The introduction of the MSO concept incorporates all of the HUMINT Collector's responsibilities. Interrogation operations, for example, are now part of MSO, rather than being a separate operation. HUMINT Source Contact Operations is now included in U.S. Army Interrogator (MOS 97E) training and the doctrine for Source Contact Operations is now included in FM 2-22.3.

Expanded Doctrine

A number of other topics in FM 34-52 have been given additional attention in FM 2-22.3. One such topic is the issue of command and control relation-

(Continued on page 4)

CSM Forum

by Command Sergeant Major Franklin A. Saunders
Command Sergeant Major, U.S. Army Intelligence Center and Fort Huahcuca

Hello Team, the Intelligence Master Analyst Course (IMAC), the follow-on to the ASAS Master Analyst Course (AMAC), embraces the current technologies inherent in the Distributed Common Ground System–Army (DCGS-A). IMAC provides training in advanced analytical skills and methodologies utilizing the DCGS-A V2, Joint Intelligence Operations Capability-IRAQ (JIOC-I) suite of applications. The course develops advanced skills in: Intelligence Preparation of the Battlefield (IPB) and the intelligence process; counterterrorism analysis; threat assessment; configuration management; preparation of tactics, techniques, and procedures (TTPs); troubleshooting the intelligence processing architecture, and integration of automation into operations.

Critical thinking, and its application in analysis, problem solving, and the Military Decision Making Process (MDMP), is a cornerstone and is developed throughout the duration of the course. In addition, areas of emphasis include the military occupational specialty (MOS) skills relating to analysis; the contemporary operational environment (COE); denial and deception operations; Trojan SPIRIT II/Trojan LITE operations, and skills relating to threat equipment, organization and tactics. Curriculum focuses on, but is not limited to, the following software applications: Pathfinder, QueryTree NG, Analyst Notebook, ArcGIS, NAI Tool, Psi Jabber, Starlight, Flight Control, and GDM (Geospatial Display Manager).

IMAC is an ASI producing course (ASI 1F) with a length of nine weeks. Given the nature of DCGS-A, a flat network with tools for all intelligence disciplines, all Military Intelligence Warrant Officers and Noncommissioned Officers are welcomed to attend this course. However, only MOSs 98C Signals Intelligence Analyst and 96B Intelligence Analyst can currently hold the ASI. IMAC has three iterations per year, with 15 seats available per class. The schedule for the Fiscal Years 2007 and 2008 is as follows:

IMAC 07-001	16 Oct to 18 Dec 06
IMAC 07-002	26 Mar to 24 May 07
IMAC 07-003	09 Jul to 07 Sep 07
IMAC 08-001	15 Oct to 18 Dec 07
IMAC 08-002	24 Mar to 22 May 08
IMAC 08-003	14 Jul to 12 Sep 08

We are in the process of acquiring 15 more work stations to train 30 per class. Again, the IMAC course will be open to all Intelligence MOSs (96B/D/H, 97B/E, 98C/G/Y) if they are working in a Fusion Cell.

As always I am extremely proud of our Intelligence Warriors and the contributions you make each day to support our Nation at War!

Always Out Front!
SOLDIERS ARE OUR CREDENTIALS

(Continued on page 5)

(Continued from page 2)

ships. HUMINT Collection Teams (HCTs) often work in Joint environments, so it is important that leaders at all levels understand the command and control relationships under which HUMINT collectors might operate. Army and Joint command control relationships are clearly presented in the manual.

The roles and relationship between the Military Police (MP) internment/resettlement mission and HUMINT collection operations are clearly explained in the manual including planning, command and control, and many legal considerations and discussions. Charts and detailed text explain the specifics of required coordination for the conduct of HUMINT collection operations when a detainee population is under the custody of MPs. MPs are clearly prohibited from setting the conditions for interrogations. Doctrine writers from USAIC and U.S. Army Military Police School have worked together closely to ensure that FM 2-22.3 and the MP **FM 3-19.40, Internment and Resettlement Operations,** are complementary and synchronized with each other concerning these vital issues.

New Topics

A number of additional new topics have been added to FM 2-22.3. Two chapters in the main body of the FM address the topics of HUMINT analysis and automation. New approaches present material on:

- ❑ Source Reliability.
- ❑ Pre-Deployment Planning.
- ❑ Questioning Guide.
- ❑ Contract Interrogators.
- ❑ Equipment for HCT Operations (HCT Kitbag).

Medical responsibilities and considerations are discussed in Chapter 5. Commander, medical personnel, and HUMINT collector responsibilities are clearly listed. As noted above, the manual has been reviewed by legal staffs at every level of the Army and DOD. The manual also outlines other terms relative to the Geneva Conventions. Threaded throughout the FM is the theme of one standard for humane treatment. FM 2-22.3 is fully consistent with the single standard for humane detainee treatment, regardless of status, in accordance with the Detainee Treatment Act of 2005, the Geneva Conventions (including Common Article 3) and DOD Policy. The manual is completely consistent with the explicit recognition in the Law of War, including Geneva Conventions, that detainees may receive different treatment based on their status. FM 2-22.3 explicitly prohibits torture or cruel, inhumane or degrading treatment or punishment in all cases and provides an illustrative list of prohibited practices that would constitute abuse.

FM 2-22.3 makes clear that commanders of forces conducting HUMINT operations are directly responsible and accountable to ensure humane detainee treatment in accordance with, ". . .applicable law and policy, including U.S. law; the law of war; relevant international law; relevant directives, including:

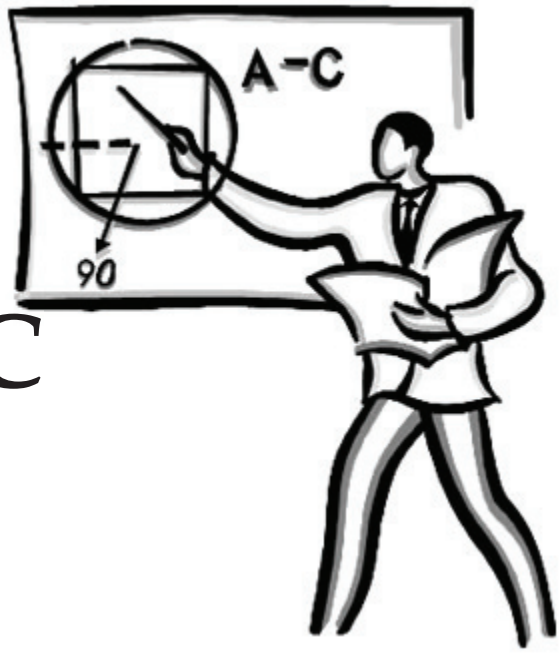
- ❑ DOD Directive 3115.09, DOD Intelligence Interrogations Detainee Debriefings Tactical Questioning.
- ❑ DOD Directive 2310.01E, The DOD Detainee Program.
- ❑ DOD instructions and military orders, including fragmentary orders."

In Chapter 8, the manual discusses applying 18 approach techniques that a HUMINT collector can orchestrate as part of an interrogation strategy. These approach techniques include all of those included in the last approved version of FM 34-52 (1992) plus two additional techniques which require approval at the Colonel level and accompanied by some oversight considerations. Appendix M discusses one restricted technique–Separation, that can be used only on specially identified unlawful enemy combatants. It cannot be employed on an Enemy Prisoner of War (EPW). Separation is employed ". . . to deny the detainee the opportunity to communicate with other detainees in order to keep him from learning counter-resistance techniques or gathering new information to support a cover story . . .". The manual's appendix provides a comprehensive list of the approval process, responsibilities, and general controls used in Separation.

FM 2-22.3 is written for the Soldier. It is an important step forward in the continuing effort to provide the Soldier with the best and latest tools to accomplish the mission.

Always Out Front!

Teaching Critical Thinking Skills Across the USAIC Curriculum



by George Van Otten, PhD and Leon Leszczynski, MA

Introduction

It is common for leaders and instructors at the U.S. Army Intelligence Center (USAIC) to discuss the importance of critical thinking (CT) while at the same time stressing the importance of teaching students to "think outside the box." Unfortunately, many people tend to link CT and creative or innovative thinking so closely together that they begin to believe that the two are synonymous. They are not, as they represent different thought processes and result in different outcomes. The purpose of this paper is to define CT, relate it to the experiential learning process and explain how CT and scientific inquiry (SI) are used during the military decision making process (MDMP).

Critical thinking is the formal, cognitive process used to convert sensory stimuli into meaningful, reliable and verifiable information that can be used to solve a problem, answer a question, make a decision, or add to a learner's knowledge of the world. The environment is the source of the stimulation that learners perceive through their senses and the instruments used to extend the range and accuracy of their senses (e.g., thermometers, microscopes, altimeters, etc.). There are two primary reasons for stressing the development of CT skills *within* the instructional environment of USAIC. First, the use of CT enhances learning; and second, useful intelligence is a product of the application of CT skills.

At the Intelligence Center, instructors develop lesson plans based upon the levels of learning defined in Bloom's Taxonomy of Educational Objectives. These levels include basic knowledge, comprehension, application, analysis, synthesis, and evaluation.[1] In general, it is appropriate to view *analysis* as the application of CT skills and to view *synthesis* as analogous to creative thinking. Evaluation is necessary for the assessment and validation of either process.

The Scientific Method

The Scientific Method (SM) is an organized, systematic, cognitive process used by scientists to analyze, interpret, evaluate, and verify the data they observe and collect. Because the word "scientific" is used to modify the word "method," many people mistakenly believe that the SM is used exclusively by scientists. It is not, the SM can be used by anyone who wants to solve a problem or to answer a question. The SM consists of six steps:

1. Define the problem.
2. Review literature/information review.
3. Generate hypotheses ("educated "guesses").
4. Collect information to test or evaluate the hypotheses.

5. Formulate a conclusion.

6. Verify and re-verify the conclusion.

On the surface, these steps seem relatively simple. For example, when a baby cries, its parents want to know why. Based on past experiences they make an educated guess (hypothesis) that the baby is wet. Suppose that then they test their guess by checking and find no incriminating evidence. Next, they postulate that the baby is hungry. They test this hypothesis by giving the baby a warm bottle of milk. If the baby stops crying, they have reasonably validated their hypothesis.

Problems, however, are not always this simple. Some are difficult to define, let alone solve. For example, theories concerning atomic structure have markedly changed during the last half-century because science is self-correcting. As atomic research has become increasingly sophisticated, so too have its findings and results.

CT and Learning

Whereas educators have argued intensely about the most effective ways to enhance learning, it has become increasingly evident that learning is a process, not simply an outcome. In fact, learning is a continuous process grounded in experience. Learning, by its very nature, is a tension and conflict filled endeavor. It also requires effort on the part of the learner. In order to learn, students must recognize and resolve conflicts between *experience* and *abstraction* and between *observation* and *action*.

Furthermore, learning also involves the dual processes of the *accommodation* of ideas to the external world and the *assimilation* of experience into existing concepts (assimilation and accommodation are adaptive complementary processes). Learning is holistic in that it involves thinking, perceiving, feeling, and behaving, and it is the major foundation of human adaptation.[2]

Research now supports the notion that the least effective method of instruction for long-term retention is auditory. When auditory instruction is coupled with visual instruction, long-term retention increases. And when hearing and seeing are joined with doing, retention increases dramatically.[3]

Note: A *learning theory* is a model of the learning process, whereas an *instructional theory* is a model of how the learning process may be optimized to achieve learning goals.

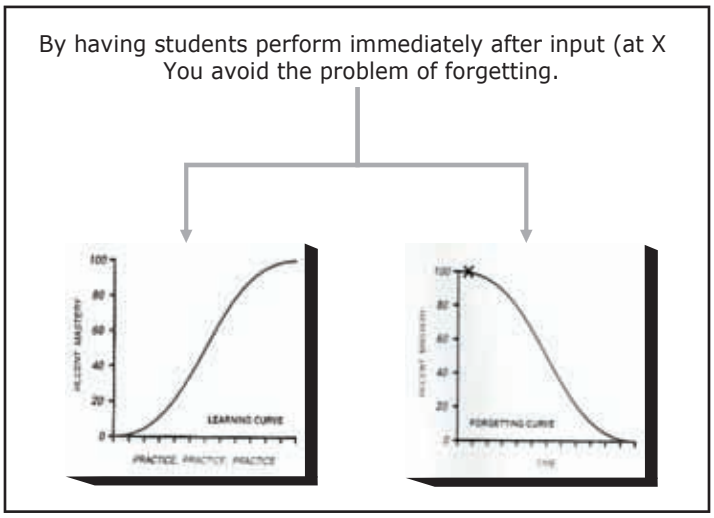


Figure 1. Knowledge Retention

Scientific Inquiry Simulates CT

Simply defined, *scientific inquiry (SI) is a process through which learners employ the scientific method to confirm or refute their hypotheses about observations and theories.* The SI model of instruction requires students to observe or experience a phenomenon and to construct a problem statement relative to what they have seen or experienced, then pose a hypothesis (an educated guess) that seeks to answer the question identified in the problem statement. Once a logical, defensible hypothesis has been developed, learners must create a bias-free research design with which they will test the validity of the hypothesis. Based on the results, learners will draw conclusions and modify their mental construct and/or informational base.[4]

Therefore, in an intelligence-based instructional setting, after students have been exposed to a concrete experience, an instructor might wish to proceed as follows: First, encourage students to describe, define, and explain the experience. Second, direct them to develop a problem statement about what they do not know or understand relative to the concrete experience.

Third, direct students to use *inductive* and *deductive*[5] reasoning to create a hypothesis that answers the question posed in the problem statement. Fourth, direct students to explore and experiment using available resources to test the validity of the hypothesis, and then use the results to draw defensible conclusions.

The Experiential Learning Model

SI and the experiential learning model are similar. New knowledge, skills, or attitudes are achieved interactively through the four modes of experiential learning. These are: *concrete experience, reflective observation, abstract conceptualization,* and *active experimentation.*

Concrete experience is the sensory input people receive from the environment. Immediate concrete experience is the basis for observation and reflection. During reflective observation, learners relate sensory input to their existing mental constructs and personal theories through which they interpret the world. While applying abstract conceptualization, learners formulate theories that predict and explain the phenomenon they have experienced. During active experimentation, learners validate their hypotheses or modify and revise them as necessary.[6]

When employing the inquiry model of instruction, it is important to remember that students and instructors alike come to the educational setting with specific personal orientations. These orientations or mind sets, which are the result of an individual's experience and culture, serve as filters through which all experiences and observations pass as they become part of one's world view. When these individual orientations or mind sets override SI, objectivity is sacrificed in favor of personal bias. Therefore, the purpose of SI in the educational process is to enhance the likelihood that learning will result in the exposure to truth and the creation of knowledge rather than the reinforcement of individual biases and prejudices.

Integrating CT Into the Instructional Process

Many educators tend to use the terms experiential learning and constructivism interchangeably and for most practical intents and purposes the differences between the two are not huge. Nevertheless, they differ somewhat in definition and in the specific details of their basic structure. Kelly notes that although experiential learning, as articulated by David Kolb, ". . . connects learning to real-life situations, the theory also defines the cognitive processes of learning. In particular, it asserts the importance of critical reflection in learning."[7]

Constructivism builds on experiential theory. It is, in fact, a practical application of the work of David Kolb and others. There are two major foci associated with constructivism. These are *cognitive constructivism* and *social constructivism*. The two approaches are similar. Both allow for multiple representations of reality, thereby avoiding over simplification of the real world, and both emphasize knowledge construction through student involvement in real-world settings or case-based learning instead of knowledge reproduction. Further, both encourage thoughtful reflection on experience, thereby enabling context and content dependent knowledge construction, and both support collaborative construction of knowledge through social negotiation instead of competition between learners. [8]

Cognitive constructivism rests on the notion that people mentally construct knowledge by interpreting information and drawing inferences from it. Social constructivism suggests that students learn best when they collaborate with other students in discovery and higher-order learning activities facilitated by their teachers. Whereas the experiential learning model provides the theoretical framework needed to understand the relationship between critical thinking and learning, constructivist theory provides the practical foundation for SI that is the essence of CT.

Experiential/Constructivist Learning Theory and CT

In order to successfully develop the abilities of Military Intelligence (MI) soldiers and civilians to think critically, it is necessary to consistently integrate the application of these skills throughout the curriculum. This can be accomplished without increasing the length of courses and without additional resources through the implementation of instructional approaches that employ the basic tenets of experiential/constructivist learning theory.

Experience-based learning theory rests firmly on the notion that in order to effectively learn and retain knowledge, students must be actively engaged with the material they are studying. This is not a new idea. In the 1920s**,** the psychologist, Jean Piaget, postulated that intelligence is shaped by experience and that knowledge cannot be separated from experience. In the 1930s, John Dewey argued that ". . . there is an intimate and necessary relation between the processes of actual experience and education."[9]

Lewin's Model

In the 1940s, Kurt Lewin called for the integration of SI and social problem solving throughout the academic curriculum. He believed that learning is best facilitated in an environment where there is tension and conflict between

immediate *concrete experience* and *analytical detachment*. He strongly rejected the behaviorist theory of learning that treats learners as empty vessels to be filled with knowledge. Lewin was ahead of his time because he insisted that learners must actively participate in the educational process. *Therefore, he believed that little learning takes place when students are merely passive recipients of input.*

Lewin's model (Figure 2) can be represented as a circle of learning, starting with *concrete experience* at the top and moving clockwise through each quadrant. The experiential learning model requires students to operate in each of the quadrants in the circle of learning.

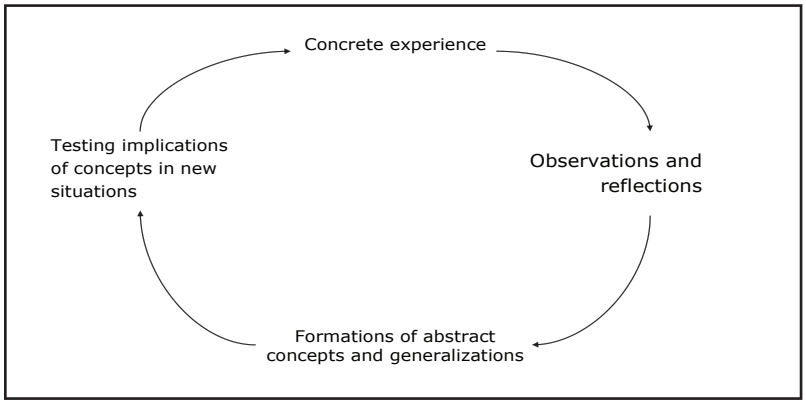


Figure 2. The Lewinian Experiential Learning Model.[10]

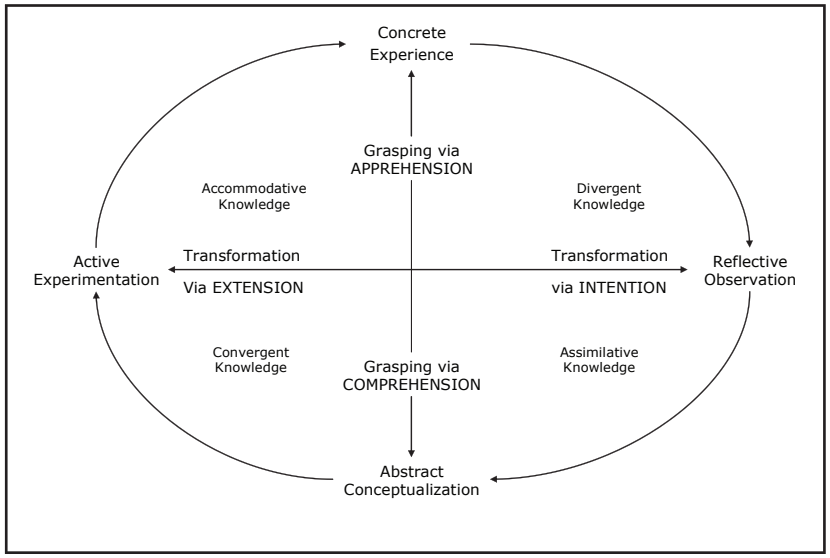


Figure 3. Structural dimensions underlying the process of experiential learning and the resulting basic knowledge forms.[11]

Kolb's Model

More recently, David Kolb honed the experiential learning model into a four-stage cycle (Figure 3). As with Lewin, this cycle is represented as a circular pattern with *concrete experience* at the top.

According to Kolb, knowledge results from the combination of grasping experience and then transforming it. He suggests two opposed forms of gaining knowledge and two opposed forms of transforming it. The result is four different elementary forms of knowledge.

Experience. There are two identifiable modes of grasping experience—apprehension and comprehension. *Apprehension* is an awareness of the stimuli associated with one's immediate environment and experiences. *Comprehension* allows a learner to mentally organize the constant flow of apprehended sensations. This process, however, occurs at the price of distorting and changing (through personal perception) the flow of experience. Nevertheless, it is comprehension that makes it possible for humans to communicate their experiences, thereby transcending space and time. Comprehension allows learners to predict and recreate apprehended experiences.

Experience grasped through *apprehension* and transformed through *intention* results in *divergent knowledge*. Experience grasped through *comprehension* and transformed through *intention* results in *assimilative knowledge*. If experience is grasped through *comprehension* and transformed through *extension* the result is *convergent knowledge*. Finally, when experience is grasped through *apprehension* and transformed by *extension* the result is *accommodating knowledge*. These forms of knowledge are foundational blocks for higher levels of learning. The point is that learning and knowing require the learner to grasp experience and transform it into the learner's personal knowledge base. Therefore, neither experience nor transformation alone can effectively foster higher-level learning.

In order to understand the difference between comprehension and apprehension processes, it is necessary to consider differences between the **left** and **right hemispheres** of the **brain**. The human brain is divided into two modes of consciousness. The left mode corresponds to the comprehension process, whereas the right mode corresponds to the apprehension process. The left mode is verbal, analytical, symbolic, abstract, temporal, rational, digital, logical and

linear. The right mode is nonverbal, synthetic, concrete, analogic (seeing likenesses between things), non-temporal, non-rational, spatial, intuitive, and holistic (see figure 4).

Whereas all people use both hemispheres of the brain, individuals tend to rely on one more than the other. This means, relative to educational practice and theory, that some students are naturally more comfortable in learning through comprehension by relying on the left mode of the brain, whereas others are more comfortable in learning through apprehension by relying more on the right mode. The experiential learning model recognizes these learning preferences and the limitations associated with relying almost exclusively on one mode or the other. Therefore, the experiential approach to learning seeks to develop the learner's abilities to both apprehend and comprehend that which they experience.

L-MODE	**R**-MODE
❑ **Verbal: Using words to name, describe, define.** ❑ **Analytic: Figuring things out step-by-step and part-by-part.** ❑ **Symbolic: Using symbol to stand for something. For example, the drawn form  stands for eye. The sign + stands for addition.** ❑ **Abstract: Taking out small bit of information and using it to represent the whole thing.** ❑ **Temporal: Keeping track of time, sequencing one thing after another: doing first things first and second things second, etc.** ❑ **Rational: Drawing conclusions based on reason and facts.** ❑ **Digital: Using numbers as in counting.** ❑ **Logical: Drawing conclusions based on logic: one thing follows another based on logical order-for example, a mathematical theorem or a well stated argument.** ❑ **Linear: Thinking in terms of linked ideas, one thought after another, often leading to a convergent conclusion.**	❑ **Nonverbal: Awareness of things, but no minimal connection with words.** ❑ **Synthetic: Putting things together to form wholes.** ❑ **Concrete: Relating to things as they are, at the present moment.** ❑ **Analogic: Seeing likeness between things; understanding metaphoric relationships.** ❑ **Nontemporal: Without a sense of time.** ❑ **Nonrational: Not requiring a basis of reason or facts; willingness to suspend judgment.** ❑ **Spatial: Seeing where things are in relation to other things, and how parts go together to form a whole.** ❑ **Intuitive: Making leaps of insight, often based on incomplete patterns, hunches, feelings or visual images.** ❑ **Holistic: Seeing whole things all at once; perceiving the overall patterns and structures, often leading to divergent conclusions.**

Figure 4. Comparison of left mode and right mode characteristics[12]

Transformation of Information. *Intention* and *extension* are dual *transformational* processes, playing significant roles in the creation of meaning. *Intention* is defined as intellectual operations; *extension* can be defined as behavioral actions. Carl Jung described the concepts of intention and extension as analogous to the personality traits of *introversion* and *extroversion*. In Jung's opinion, truth could be found only through the dynamic integration of introverted and extroverted attitudes.[13]

Building on Jung's work, Jerome Kagan provides further insights into the nature of intension and extension. He identified a dimension that he called *impulsivity-reflection*. This dimension is the degree to which a learner reflects on the validity of his/her hypothesis, and it emphasizes the positive skills of the introvert—impulse control and reflection. Kagan also notes that people change their orientation in response to environmental demands. For example, if students are encouraged to take their time, reflection increases; if they are rushed, reflection decreases. Kagan's work suggests that reflective and impulsive people have different underlying motivational dynamics. The more a learner fears error, the more reflective he/she will be. Reflective types then, tend to be very adverse to error, whereas impulsive learners may offer an opinion or a solution with far less care. Therefore, individuals who lean toward *extensional transformation* are most concerned about maximizing success and less concerned about failure or error along the way. Learners who lean toward *intentional transformation* are primarily focused on avoiding failure and are willing to forego successful performances in order to preclude error.[14]

Learning Styles and Experiential Learning

Learning is a complicated process that involves apprehension and comprehension as well as integration and extension. Because these modes of learning build upon one another, their synthesis leads to higher levels of learning. Moreover, learning at any point in time may be influenced by one of these processes or all of them simultaneously.

The learning process differs from person to person because every individual is unique and because each has learned personal adaptive processes and behaviors. Therefore, it is important for instructors to understand the various learning styles and to develop lesson plans that encourage students to operate in all quadrants of the **learning circle**.

Kolb identifies four basic learning styles. These styles are consistent with the four basic learning modes—concrete experience, reflective observation, abstract conceptualization, and active experimentation. The four basic learning styles are as follows:

1. The ***convergent learning style*** relies primarily on abstract conceptualization and active experimentation. Those who favor a convergent learning style are good at problem solving, decisionmaking, and the practical application of ideas. They do best in situations where there is a single answer or solution to a problem. Convergent learners are generally in control of their emotions and like technical problems more than social issues.

2. The ***divergent learning style*** is characterized by strengths that emphasize concrete experience and reflective observation. Learners who are comfortable with this style are imaginative and have a keen sense of meaning and value. They are adaptive and tend to view experiences from many perspectives and organize relationships into useful patterns. Divergent learners emphasize adaptation through observation more than through action. Furthermore, they enjoy brainstorming, are interested in social encounters, and are emotive in personality.

3. The ***assimilative learning style*** rests on abilities associated with abstract conceptualization and reflective observation. The strengths of this orientation are inductive reasoning and the creation of theoretical models in assimilating seemingly disparate observation into an integrated synthesis. Assimilative learners like to deal with ideas, abstract concepts, and logical theories.

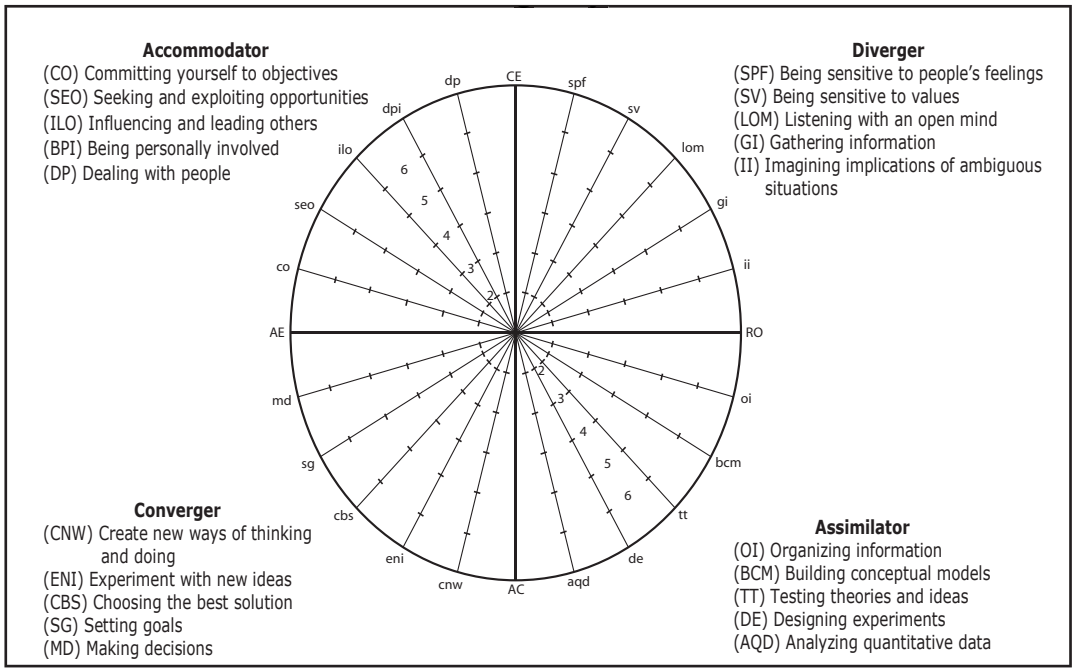


Figure 5. The competency circle, showing adaptive competencies as they relate to learning styles.[15]

4. The ***accommodative learner's*** strengths are the opposite of those of assimilative learners. The accommodative learning style focuses on concrete experience and active experimentation. Accommodative learners are good at carrying out plans, and getting things done. They like new experiences and seek opportunities for risk taking and action. They are effective problem solvers and tend to rely on intuition and trial and error. They also tend to lean on other people for information. Accommodative people are sometimes impatient.

How to Integrate Critical Thinking Into the Instructional Process

Given what has been presented about experiential learning theory and its relationship to critical thinking, the next logical step is to state the problem that is central to this paper. The purpose of this endeavor is to describe how instructors can effectively educate modern soldiers who have been raised in a time of instant information and instant gratification. This cannot be accomplished by simply finding unique ways to use computers in traditional courses or by adding enhanced images to traditional PowerPoint lectures. Instead, instructors at USAIC must develop effective ways to engage students in the learning process.

Although this discussion focuses on the value of experiential learning, constructivist learning, and SI in developing the CT skills of intelligence professionals, it does not automatically follow that well crafted lectures or other appropriate vicarious experiences are not worthwhile teaching techniques. In fact, there often is great economy and usefulness in the enthusiastic delivery of a properly prepared lecture. A good lecture, an interesting field trip, or an excellent film may be the basis for subsequent SI and CT.

The connections between constructivist learning theory, SI and CT have been previously established. In order to discuss the effective application of these theories and techniques, it is necessary to provide specific pedagogical details. SI, which is at the heart of CT, can be applied in an academic setting in a variety of ways. For example, the ancient Socratic method of instruction employs the basic tenets of SI.

Socratic Method. Instructors who rely on the Socratic method, utilize a question and answer technique. They usually present something to the students or ask them to observe a specific phenomenon and then proceed by asking them to respond to specific questions relative to what they have experienced. This approach is somewhat teacher–centered, but, if properly executed, causes students to directly engage in reflective observation and abstract conceptualization. If however, the questions posed by the instructor are too simplistic or poorly constructed, the students will not be able to form realistic hypotheses or develop useful mental constructs.

In a lesson on the nature of civil war (presupposing that the students experienced a lecture or some other form of concrete experience relative to civil war), an appropriate example of the Socratic method would be for an instructor to ask students, collectively or individually, to respond a series of questions such as:

1. What is a civil war?

2. Does anyone else have a different definition? **Note:** Assuming the students responded with several different definitions.

3. How are these definitions similar?

4. How are they different?

5. Can you think of any places in the world that civil war is ongoing or probable?

6. How do these examples meet the criteria established earlier in our definition of the term? **Note**: If the students determine that their examples are not consistent with their definition of civil war, the teacher encourages them to redefine the term, and if they decide their definition is appropriate, choose other examples.

7. Given the definition and examples above, What are common underlying causes of civil wars?

8. What are the international implications of civil wars?

9. Is it possible for anything worthwhile to come out of a civil war? If yes, What? If not, Why not?

Whereas the Socratic method informally uses elements of SI, it is less structured and more teacher–oriented. Instruction based on the formal implementation of SI requires students to develop the problem statements (questions), create the explanatory hypotheses, accomplish some form of experimentation or fact finding to test these hypotheses and finally, draw reasonable conclusions. Therefore, SI is a formal process through which students practice CT and decisionmaking.

SI Approach. Staying with the example of the civil war, the following describes how an instructor might approach the implementation of SI in classroom:

1. The students are provided some form of concrete experience relative to civil war. This might take the form of expert testimony (lecture), a film on civil war, a visit to a museum dedicated to civil war, a reading assignment, or all of the above.

2. The instructor would direct students, collectively or individually, to develop a problem statement or a set of questions relative to their concrete experience (what it is they want to know, but do not know.). For example, students might ask, “What causes people within a nation to be willing to kill their fellow citizens during a civil war?”

3. The instructor would then direct the students to create hypotheses (propose educated guesses) that answer the problem statement or question. **Note:** The instructor must make certain the materials needed to create such hypotheses are available to students. A possible hypothesis could be that civil wars occur because people on both sides lack the communication skills necessary to resolve their differences without resulting to violence.

4. The students would then create a research design (an unbiased approach) through which they test the validity of their hypotheses.

5. In keeping with the results of their research, the students would then draw conclusions and make appropriate adjustments to their hypotheses, and thence, to their mental constructs.

Differences In the Scientific Method, Scientific Inquiry, and Constructivism

Notice the difference between the Socratic method and the formal application of SI. In the first, the dialogues between the student and the educator are instructive in that they recommend or explain something; but, in many cases, state a problem without providing a solution.[16]

Whereas the role of the Socratic teacher is to draw students out through artful questioning, instructors employing the SI method are more facilitators of learning than sources of knowledge. It is their job to guide students around the circle of learning (as described by Kolb) as they use SI to apply CT skills.

Almost all descriptions of the constructivist teaching model require or espouse a process that is identical to the SI model. The constructivist educator creates an environment that allows students to develop problem statements and then monitors students as they proceed through the inquiry process. Because this promotes new patterns of thinking, classes may arrive at unexpected conclusions. Nevertheless, in the constructivist classroom, students have the autonomy to conduct their own experiments. For example, when studying the American Civil War, the constructivist instructor would not simply assign readings and provide lectures. Instead students would be directed to examine a variety of informational sources and then ask them to assume the role of various prominent personalities of the time and place under consideration. The purpose of role playing is for students to approximate what it would have been like to have held a particular position and mindset relative to the nature of the simulated environment of the time. If students reach conclusions that cannot be supported through scientific inquiry, the instructor/facilitator must direct the learners to revisit the problem and reconsider all the evidence.

Simulations and Exercises

The use of practical exercises, field training exercises, and scenarios are commonplace within the instructional environment of USAIC. For the most part, these exercises and scenarios allow students to apply what they have learned and to problem solve. Therefore, although there is a smattering of SI throughout the curriculum, it is often not identified as such and it is only sometimes directly related to the enhancement of the CT skills of the learners.

The Joint Intelligence Combat Training Center at Fort Huachuca, Arizona operates on the premise that students learn best when they are offered the opportunity to practice their specialties in real-world conditions via realistic operational simulations. This is entirely in keeping with the basic tenets of constructivist learning theory and SI. Despite the hands-on emphasis of this realistic training however, there remains considerable room for enhanced CT. This can be accomplished by modification of current lesson plans through the inclusion of SI.

In order to evaluate lesson plans relative to whether or not they meaningfully address CT skills, it is necessary to notice whether or not students are consistently challenged to articulate problems, pose hypotheses, and find solutions. If this application of SI is readily apparent, CT skills are being addressed. If it is not, make the changes needed to infuse CT into the curricula.

Scientific Inquiry in Classroom Instruction

Critical thinking skills are usually addressed less in the formal classroom structure than in any other instructional environment in the Intelligence Center. Whereas the quality of lectures and presentations are generally excellent, most lesson plans do not guide instructors to take the steps necessary to foster SI and CT. Instead, most lesson plans continue to rely on traditional instructional methods that place the instructor at the center of learning and treat the learner as an empty container waiting to be filled with knowledge. In order to integrate CT throughout the curricula, it is nec-

essary to change lesson plans so that they formally embrace SI. This can be done through the utilization of Socratic questioning and problem solving. In order to fully address CT, instructors must be prepared to walk students around the entire circle of learning as presented in **Kolb's Experiential Learning Model** (figure 3). For example, instead of simply lecturing students about the nature of Iraqi culture, SI calls for the students to apply the tools of cultural analysis to specific issues and problems. Therefore, cultural awareness training should begin with an overview of the concepts and tools of analysis needed to make rational judgments about various cultures. These tools include concepts such as tribalism, monotheism, paternalism, extended family, and passive-aggressive resistance. Once students understand the basics of such concepts, they should be asked to apply them to real or simulated cultural situations in order to solve problems, answer questions, or make predictions. The difference in these two approaches is that in the exclusive lecture method, students only passively relate to the materials they are given; whereas, in SI they are required to actively engage in the process of solving problems and creating knowledge and information.

It should be noted that the SI method requires students to put much more effort into the learning process than they normally would in a traditional academic setting. This is because CT is not a passive process.

Critical Thinking and MDMP

In the MI Officer Basic Course, students are taught the MDMP and the IPB processes. Although the similarities between SM and the MDMP are not currently stressed in MI lesson plans, comparison of the two clearly demonstrates that they are related. Although the formal description of the steps in SM and MDMP are slightly different, the processes and end results are the same—meaningful, reliable, and verifiable information that can be used to make a decision.

The MDMP consists of the following steps:

1. Receipt of Mission
2. Mission Analysis
3. Course of Action (COA) Development
4. COA Analysis
5. COA Comparison
6. COA Approval
7. Orders Production

On the surface, the MDMP bears little resemblance to the SM. For example, the steps taken in each process differ in number and do not appear to be the same. Moreover, the foci of the MDMP are military operations, while the foci of the SM are experiments conducted in laboratories or other research environments. Appearances, however, are often deceiving. For example, the first step of the SM requires its practitioners to define the problem. In the MDMP, the problem is simple, "What COA will most likely accomplish the mission?" This question is formulated during the first step of the MDMP process-receipt of mission.

In order to answer this question, intelligence analysts and other staff personnel complete steps one through five of the MDMP. A few of the questions they ask during the first two steps of the MDMP include, but are not limited to the following: Is the mission clearly, concisely, and accurately defined? What is the higher commander's intent? What information is available concerning friendly forces, enemy forces, and the areas of operation and interest? What information is missing? What collection assets must be used to obtain it? Has the collection effort been successful?

In order to answer these and other questions, analysts and staff personnel extract pertinent information from existing databases; identify information and intelligence gaps; task collection assets to obtain the information required to produce intelligence; analyze incoming information from those assets; add information and intelligence to the appropriate databases, and disseminate that data to individuals and units in immediate need of it. During mission analysis, analysts and staff personnel identify what they know and task collection assets to obtain the information and intelligence they do not know. In short, they collect information the commander must have to identify the best COA to accomplish the mission and to make subsequent decisions as the rapidly changing operational situation dictates.

Analysts and staff personnel, however, do more than merely collect information. They use that information to develop possible friendly COAs that the commander might employ to accomplish the mission. After they are developed, the COAs are tested (through war gaming), evaluated, and compared. Then, a conclusion is reached and a recommended COA is identified. If these actions sound familiar, they should, they represent steps three, four, five, and six of the MDMP process and steps three, four, and five of the SM.

In step six of the MDMP, analysts and staff personnel provide a decision briefing to the commander during which they recommend the best COA that they believe the commander should use to accomplish the mission. He can approve it, modify it, or reject it. If the commander approves the recommended COA, he issues final planning guidance and orders are produced. If the commander modifies or rejects the COA, his staff must either incorporate his modification and the implications thereof or, if he rejects it, start over.

Conclusion

There are two primary reasons for stressing the development of CT skills *within* the instructional environment of USAIC. First, the use of CT enhances learning; and second, useful intelligence is a product of the application of CT skills. In order to successfully function as MI professionals, soldiers and civilians must become skilled analysts with advanced critical thinking abilities. The most effective way to develop critical thinking skills is through an experiential learning process that calls for the repeated practice and application of scientific inquiry in real-world simulations and situations. Critical thinking can be integrated into the curriculum without adding time or resource requirements to existing lesson plans. Nevertheless, it will be necessary to develop a train-the-trainer course and to set aside sufficient time for instructors to learn more about scientific inquiry and experiential learning.

Endnotes

1. David Krathwohl, David Bloom, and Benjamin Masia, *Taxonomy of Educational Objectives: The Classification of Educational goals, Handbook II: Affective Domain* (New York: David McKay Company, Inc., 1965), 186-193.

2. David Kolb, *Experiential Learning: Experience as the Source of Learning and Development* (New York: New Jersey: Prentice Hall, Englewood Cliffs, 1984), 20-60.

3. Fred Jones, *Tools for Teaching* (Santa Cruz: Fred H. Jones and Associates, 2000), 73-81.

4. Byron Massialas and Benjamin Cox, *Inquiry in social Studies* (New York: McGraw Hill Book Company, 1966), 89-110.

5. Deductive reasoning moves from the general to the specific starting with a theory, leading to an hypothesis followed by observations or experimentations that either confirm, reject or modify the theory. Inductive reasoning moves from the specific to the general so that an observation may lead to a general hypothesis that in turn leads to a general conclusion or theory. Validation of a product of inductive reasoning may be the result of emersion research or judgment sampling. From W. Trochim, The *Research Methods Knowledge Base, 2nd edition* (Cincinnati: Atomic Dog Publishing Company, 2000), 1.

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(Continued on page 18)

Integrating Critical Thinking in Classroom Instruction

by Mr. Leon P. Leszczynski and George A. Van Otten, PhD

Introduction

Leaders throughout the Intelligence Community agree that effective Critical Thinking (CT) is a significant force multiplier in the current Military Intelligence (MI) operational environment. As a result, there have been numerous independent efforts throughout the last several years to train MI soldiers to develop effective analytical skills. Whereas these efforts have been largely successful, they have not been standardized and there is no single agreed upon formal definition of CT. Given this diversity of approaches to enhancing the CT abilities of students at the U.S. Army Intelligence Center (USAIC), the 111th MI Brigade Commander directed the Office of the Dean to develop a White Paper on the essential elements of CT and the foundational educational theory and pedagogy upon which CT skills could most effectively be trained.

Accordingly, we prepared the paper *"Teaching Critical Thinking Across the Curriculum of the U.S. Army Intelligence Center,"* which appears as the centerpiece article in this issue of ***MIPB***. The main point made in the paper is that CT, scientific inquiry (SI), and the scientific method (SM) are one in the same. Moreover, CT is best taught through an experiential learning process. Although some have suggested the need to introduce formal, lecture-based courses on CT that would require significant additions to current course lengths, the 111th MI Brigade approach is to simply alter the way in which existing lessons are taught in order to consistently engage students in applied problem solving using scientific inquiry. This approach rests upon experiential and constructivist learning models and encourages instructors to fully engage students in the learning process. To accomplish this, it is necessary for instructors to be well versed in scientific inquiry and be willing to create a student-centered classroom.

Most USAIC instructors attend follow-on courses after the basic Instructor Training Course (ITC) such as the Test Development Workshop (TDW), the Systems Approach to Training (SAT), and the Small Group Instructor Training Course (SGITC). While these courses provide basic information on all phases of the SAT Process, none provide a strong learning theory foundation. For USAIC instructors to modify their lesson plans and courses in order to accommodate the integration of CT across the curriculum, the Office of the Dean developed a four hour Train-the-Trainer (T3) CT Lesson Plan (LP).

Lesson Plan Design and Development

We developed the four hour T3CTLP in May 2006 and taught it to 14 USAIC instructors on 2 June 2006. After incorporating feedback into an LP revision, we taught it to 19 USAIC instructors on 12 July 2006; again, incorporating the feedback provided by these instructors into the current T3CTLP, dated 31 July 2006.

The Terminal Learning Objective (TLO) for this four hour block of instruction is:

Action: Develop an experiential learning practical exercise (PE) based on Kolb's "Circle of Learning" Model

Condition: Working collaboratively in groups of five, given four supplementary readings on terrorism, a topic, and one hour

Standard: The PE will include activities that are student centered, promote experiential learning, contain the four components of Kolb's Circle of Learning Model, and foster CT skills.

This TLO is supported by the following learning steps/activities (LS/A):

1. Define basic learning theory definitions and concepts.

2. Explain three applications of CT in the classroom.

3. Explain the relationship between Scientific Method/Inquiry (SM/I) and CT.

4. Relate experiential learning to CT and the SM/I.

5. Explain how to integrate the Socratic Method and SM/I into instruction.

6. Develop an experiential learning PE.

Conference and discussion are the instructional methods used to teach LS/A's 1 through 5. The PE gives students an opportunity to practice using the skills they have learned. During the PE, correct student performance is positively reinforced, while corrective feedback is used to bring below par student performance up to standard.

Each LS/A provides a "chunk" of information required to understand the LS/As which follow it. A brief description of the instruction contained within each LS/A and the approximate training time required is as follows:

LS/A 1. *Define basic learning theory terms and concepts (40 minutes).* In this learning step, students are introduced to learning theory terms and concepts. Learning is defined; change and experience are related to learning; and information encoding, storage, and retrieval are discussed. The terms *assimilation* and *accommodation* are introduced, as well as *apprehension* and *comprehension*. *Left brain and right brain* activities are discussed, as are *convergent* and *divergent thinking*, the learning pyramid, and Bloom's Taxonomy of Educational Objectives.

LS/A 2. *Explain three applications of CT in the classroom (20 minutes).* During this learning step, CT is defined and the terms normally associated with it are identified and briefly described. Students are cautioned that CT is defined by different people in different ways, depending on their respective academic disciplines, points of view, agendas, etc. Students are instructed that CT can be used to solve a problem, answer a question, make a decision, or add to the learner's knowledge of the world.

LS/A 3. *Explain the relationship between the SM/I and CT (25 minutes).* Here, the SM/I and its six steps are introduced to students. Students are told that the SM/I is used daily by people outside of the scientific community–both personally and professionally. To illustrate this point, we apply the steps of the SM/I to a situation commonly faced by new parents–a crying baby in its crib. The SM/I is also applied to the Military Decision Making Process (MDMP). This learning step concludes by establishing the relationship between CT and the SM/I.

LS/A 4. *Relate experiential learning to CT and SM/I (30 minutes).* This step begins by defining experiential learning. Kurt Lewin's experiential learning model is described as a "Circle of Learning." David Kolb's experiential learning model is similarly described. Kolb's four learning styles are identified, discussed and related to the learning terms and concepts introduced during LS/A 1: Assimilation, accommodation, apprehension and comprehension, convergent and divergent thinking, left- and right-brain thinking activities, etc. Typical experiential classrooms are described, as are the specific types of problems used to promote experiential learning. This learning step ends by asking students to explain how SM/I and CT facilitate experiential learning.

LS/A 5. *Explain how to integrate the Socratic Method and SM/I into instruction (35 minutes)*. In this step, the Socratic Method and its applications are introduced to the students and they are shown how to use this method to train students.

LS/A 6. *Develop an experiential PE (1 hour and 20 minutes)*. During the final step in the T3CTLP, the students are given PE directions, four supplemental readings, a topic, and one hour to develop a student-centered, experiential learning PE based on Kolb's Circle of Learning. The PE must support the following topic, "The Impacts of Islamic Perceptions of Western Culture on the World Order."

Student Feedback

The feedback provided by students has been invaluable. When the T3CTLP was first taught, students converted a teacher-centered LP to a student-centered LP. Some students objected, saying that in some instances, knowledge-based, teacher-centered training **is** required to train students. We agree, and now stress that experiential learning and its attendant methods of instruction are **not** intended to replace lecture or other methods of instruction. More feedback indicted that students with little or no background in a subject area must first be provided basic knowledge from which CT skills and abilities can later be developed.

We also redesigned the PE based on student comments. The PE now places students in the position of instructors, who are training students in Islamic Cultural Awareness. Acting in this capacity, the student-instructor must practically apply the concepts, principles, and applications learned during the class.

Several military students also alerted us that when providing military training, there are doctrinal and regulatory

limitations that must be placed on students. They must **not** be allowed to deviate from the guidance and directives provided in those publications. The class now stresses the importance of staying within the parameters provided in field manuals, Army regulations, and policy directives.

Students are provided with an advance sheet on which they can take notes and instructor biographical sketches are now available for student review. Finally, as a result of student comments, learning theory descriptions and definitions have been simplified so they can be understand by those without a degree in Education or Educational Psychology.

Conclusion

Soldiers fight thinking enemies who observe, reflect on, and adapt to our evolving tactics, techniques, and procedures, the environment in which U.S. and coalition forces must operate becomes deadlier. As our enemies adapt, so must our soldiers, but they must be trained to do so. The T3CTLP is one of many approaches that can be used by instructors to accomplish this goal.

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(Continued from page 15) ***Teaching Critical Thinking Skills Across the USAIC Curriculum***

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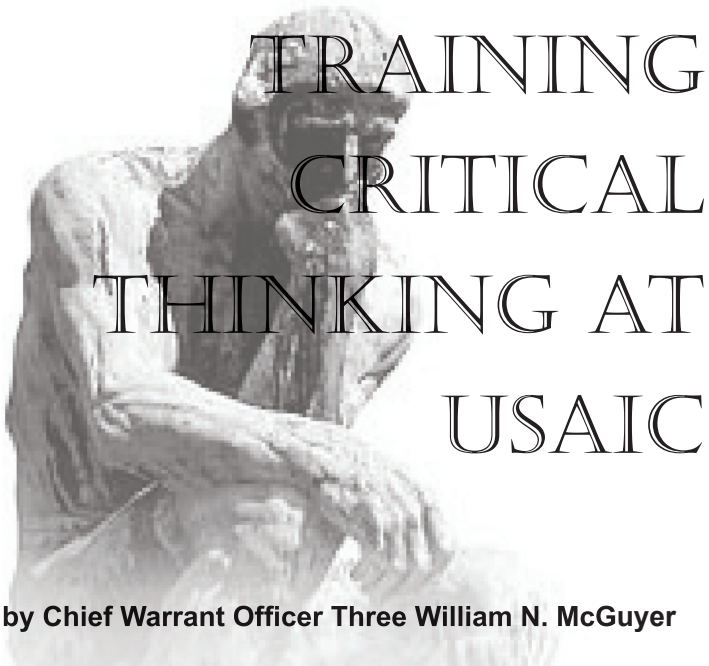

Training Critical Thinking at USAIC

by Chief Warrant Officer Three William N. McGuyer

Critical thinking can be defined as distinguishing between fact and fiction; asking critical questions; considering other interpretations; identifying assumptions; making assertions based on sound logic and solid evidence. It is much more than understanding and possessing these cognitive skills. Critical thinking concentrates on adapting one's analytic thought by improving methods of approaching issues, problems and questions.

—FM 2-33.4, Intelligence Analysis, June 2006 (Draft)

". . . critical thinking is the ability to logically assess the quality of one's thinking and the thinking of others to consistently arrive at greater understanding and achieve wise judgments."

—Colonel W. Michael Guillot, Critical Thinking for the Military Professional

Introduction

Infusing critical thinking into training into the U.S. Army Intelligence Center's (USAIC) training is not a new concept. Generations of instructors and training developers have struggled with the dilemma of improving the training of analytical skills while having to dedicate increasing numbers of limited academic hours to automation training, warrior tasks, and Army common training. This dilemma will not be solved any time soon. The U.S. Army Training and Doctrine Command (TRADOC) mandated lessons and automation training are important topics. The use of technology is a great asset in sorting and organizing the volumes of information coming into a tactical operations center (TOC) but it can hamper, rather than aid the development of an analyst. There will never be enough time to teach new analysts everything we would like to cover in Individual Military Training (IMT). However, information and sources will always require reassessments to validate their reliability and supportability. Only then can the transition from information to intelligence occur.

Critical Thinking (CT) skills, the most basic requirement for the Military Intelligence (MI) soldier, encourage and allow this evaluation to take place. USAIC strives to provide Soldiers the basic tools to be successful as they go to their initial assignments. The school does not, however, create fully developed analysts. It provides students with the basic knowledge, skills, and tools required to accomplish critical tasks in their military occupational specialty (MOS) and so begin their development as analysts. The intent of this article is not to explain CT to those unfamiliar with its concepts; there are numerous books, studies, and websites dedicated to the topic, but to describe how CT is being taught in USAIC courses and offer suggestions as to how such training might be improved and expanded upon.

Current USAIC CT Training

According to the *Foundation for Critical Thinking*, a working group of respected academic leaders in the CT field, a well-cultivated critical thinker does the following:

- ❑ Raises vital questions and problems, formulating them clearly and precisely. (commander's priority intelligence requirements (PIR); Creating a Hypothesis)
- ❑ Gathers and assesses relevant information, using abstract ideas to interpret it effectively. (Research)
- ❑ Comes to well-reasoned conclusions and solutions, testing them against relevant criteria and standards. (Synthesis of Information)
- ❑ Thinks open mindedly within alternative systems of thought, recognizing and assessing (as need be) assumptions, implications, and practical consequences. (Effects Based Targeting; Cause and Effect)
- ❑ Communicates effectively with others in figuring out solutions to complex problems. (War Gaming) [1]

Military professionals recognize these steps as one of two things: the Scientific Method or the more familiar military application, the Military Decision Making Process (MDMP). MI professionals view this process as an inherent part of the Intelligence Preparation of the Battlefield (IPB) which is the method for collecting, organizing, and processing intelligence. It is an analytic framework for organizing information to help provide timely, accurate, and relevant intelligence to the MDMP. However, as analysis

and intelligence production require such a methodology to ensure success in operational environments, so too does instruction to facilitate that success in our analysts.

Any time a logical approach (such as the Scientific Method/Inquiry) is employed, CT is involved. There are many examples of courses in which CT is taught (and is sometimes identifies as such) as in the Intelligence Master Analyst Course (IMAC) and Enhanced Analysis and Interrogation Training (EAIT). Both include lessons on CT and analytical methods.

The IPB and the MDMP lessons are models for the application of CT skills and are taught almost universally at USAIC. A case might be made that the Intelligence Analyst (MOS 96B) Course is one of functional application of CT. Students are introduced to CT concepts early and instruction emphasizes use of CT skills daily in the MOS. Practical exercises in Course of Action (COA) development, course of action analysis (War Gaming), and Intelligence, Surveillance and Reconnaissance (ISR) synchronization stress CT.

The Intelligence Basic Noncommissioned Officer Course (BNCOC) incorporates CT into Mission Analysis, COA Development, COA Analysis (or War Gaming), and Link and Pattern Analysis. The Intelligence Advanced NCO Course (ANCOC) currently teaches the concept of CT to senior NCOs to improve their ability to teach soldiers. It has been suggested that less educational and learning theory be presented and more time be spent on practical application of critical and creative thinking instead.

In the MI Captains Career Course (MICCC), a CT lesson was added to the Program of Instruction. The MICCC includes two hours of formal CT instruction in the IPB portion. Plans are under way to expand this portion of the course; however, as all practical exercises in the MICCC involve CT, the overall exposure of the student is already extensive.

Who Really Understands CT?

As stated previously, although the USAIC incorporates CT in its classrooms, it is not yet "institutionalized" and most students do not realize they have been taught the concepts and skills. It is not surprising that this should be so difficult a task. The topic is so complicated most universities do not get it right. A study conducted by the *Foundation for Critical Thinking*[2] shows that even educators at the university level are consistently unable to demonstrate a working knowledge of critical thinking principles.

This study was the first comprehensive study to determine the extent to which college faculties typically teach CT. The results are as applicable here in the Intelligence Center as they are in any of the studied universities. The study determined the methods each faculty used to teach CT; the extent to which faculty could articulate their understanding of CT, and the extent to which instructors were prepared to teach it.

Interviews were conducted with a group of randomly selected California professors from 38 public and 28 private colleges and universities. The following findings provide insight to possible improvements at USAIC:

1. Though the overwhelming majority (89 percent) claimed CT a primary objective of their instruction, only a small minority (19 percent) could give a clear explanation of what CT is. Furthermore, according to their answers, only 9 percent of the respondents were clearly teaching the concept or skills during a typical class day.

2. While 50 percent of those interviewed said they explicitly distinguish CT skills from traits, only 8 percent were able to list the skills they thought were most important for their students to develop. Furthermore, the overwhelming majority (75 percent) provided either minimal or vague reference (33 percent) or no reference at all (42 percent) to intellectual traits of mind.

3. Although 89 percent stated that CT was of primary importance to their instruction, 77 percent had little, limited, or no concept of how to reconcile lesson plans with the fostering of CT.

4. Although 81 percent felt that their graduates developed a good-to-high level of CT ability while in their program, only 20 percent said their departments had a shared approach to CT, and only 9 percent were able to clearly articulate how they would assess the extent to which a faculty member was, or was not, fostering CT. The remaining respondents had a limited concept or no concept at all of how to do this.

5. Only a very small minority (9 percent) mentioned the special and/or growing need for CT today in the face of the rapid pace of change and the increasing complexities inherent in human life. Not a single respondent elaborated on the issue.

6. In explaining their views of CT, 69 percent made either no reference at all, or a minimal reference, to the need for greater emphasis on peer and student self-assessment in instruction.

From what can be inferred from the data, it is clear that a significant percentage of faculty interviewed (and, if representative, most faculty):

- ❑ Do not understand the connection of CT to intellectual standards.
- ❑ Inadvertently confuse the active involvement of students in classroom activities with CT in those activities.
- ❑ Are unable to elaborate upon their concept of CT.
- ❑ Cannot provide plausible examples of how they foster CT in the classroom.
- ❑ Are not able to name specific CT skills they think are important for students to learn.
- ❑ Are not able to plausibly explain how to reconcile covering course content while fostering CT.
- ❑ Cannot explain what basic abilities are required either in CT or in reasoning.

This is only one study of many in this arena, but it demonstrates that CT skills are complex and perishable, and it provides avenues to improving critical thinking skills at USAIC.

Looking Forward

"In order to improve educational outcomes, instructors in the U.S. Army Intelligence Center must develop effective ways to engage students in the learning process."

—George Van Otten, PhD

To properly train Intelligence Soldiers, we must make CT a hard skill. The concept must be explained and reinforced throughout training so that students will understand it as a thinking process as they use it at one level or another during each lesson. While there is continuing interest in improving CT instruction at the Center, and although improvements in many courses have been made recently, we have a long way to go. To provide every Intelligence Soldier the basic tools for success, instructors must fully understand the concepts of critical thinking and be able to incorporate it into their instruction methods. Students must not only learn to use CT concepts in the classroom, but internalize them so as to be able to apply the process in real world scenarios.

It is not enough to simply explain CT to students. It is more important that instructors *employ* CT concepts throughout training. Instructors must demonstrate to students how to apply the concept to intelligence problems, and provide the opportunity to practice CT during complex culminating exercises. Practical application should account for 60 to 70 percent of CT instruction in the classroom.

Before we can fully employ CT in the classrooms, concepts and practical application must be emphasized in faculty training to better prepare instructors and training developers who produce and deliver fully integrated CT training to our students. The Test Development Workshop is a good example. It incorporates CT, training faculty to develop examinations that challenge students and cause them to think using a structured process to find the best logical answer to a problem.

If it is essential for instructors to foster critical thinking; then it is essential for them to have a base knowledge of the concepts of critical thinking. Some of the policy recommendations made by the *Foundation for Critical Thinking* staff transfer well to USAIC. Instructors must not only to be able to explain CT concepts in a general way to students, but must also incorporate such instruction in the classroom. Lesson design should reflect a critical thinking orientation. Four requirements are necessary for substantive change to occur:

1. Disseminate the information faculty need to change their perceptions.

2. Provide for faculty skill-building through appropriate professional development.

3. Establish a mandate to systematically teach critical thinking (and how to teach for it) in all programs of instructor education.

4. Developing an examination in critical thinking understanding and employment.

In order to maximize CT awareness and application, the following suggestions have been developed:

- ❑ Incorporate an additional course following the Instructor Training Course (ITC); the Systems Approach to Training (SAT) Course; and the Small Group Instructor Training Course (SGITC) to further hone CT skills and their implementation into curriculum and training. The expanded MICCC curriculum would be appropriate as a start.
- ❑ Reinforce CT applications in existing curriculum (i.e., ANCOC). This methodology already exists in practical exercises.
- ❑ Maximize critical thinking usage, stress the similarities between critical thinking and IPB/MDMP by clearly demonstrating how they are related.

- ❑ Ensure students recognize and understand the critical thinking methodology so that they can use it on their own in the future.

Conclusion

While most students may not realize it, the Intelligence Center incorporates various CT concepts and methods into curriculum. Efforts are under way to emphasize the importance of CT to the Intelligence Community (IC) and analysts at Fort Huachuca. What remains to be done is to incorporate critical thinking into faculty training and expand its practical application in the classroom.

The decision to examine our approaches to critical thinking instruction sets the stage for increasing levels of analytical capability in both students and instructors. The analysts' ability to employ critical thinking skills acquired at the schoolhouse ensures their ability to support their commanders' intelligence requirements.

Endnotes

1. At http://www.criticalthinking.org/aboutCT/ourConceptCT.shtml.

2. A Study of Critical Thinking in College Instruction by Richard W. Paul, Linda Elder, and Ted Bartell of the Foundation for Critical Thinking.

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Unit Profiles

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- ❑ High resolution color photographs or high resolution soft copy (preferred) of the unit crest.
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- ❑ Current unit subordination, status and mission (unclassified).
- ❑ Operations your unit has supported in the last 15 to 20 years.
- ❑ Recent special accomplishments or activities that make your unit unique.
- ❑ Images of specialized equipment (unclassified).
- ❑ POC name, email address and phone numbers for this project.
- ❑ Full unit mailing address.
- ❑ Other information you would like included, not listed above.

In order to allow our graphics designer time to create your unit crest, please send the any photographs at the earliest possible time to:

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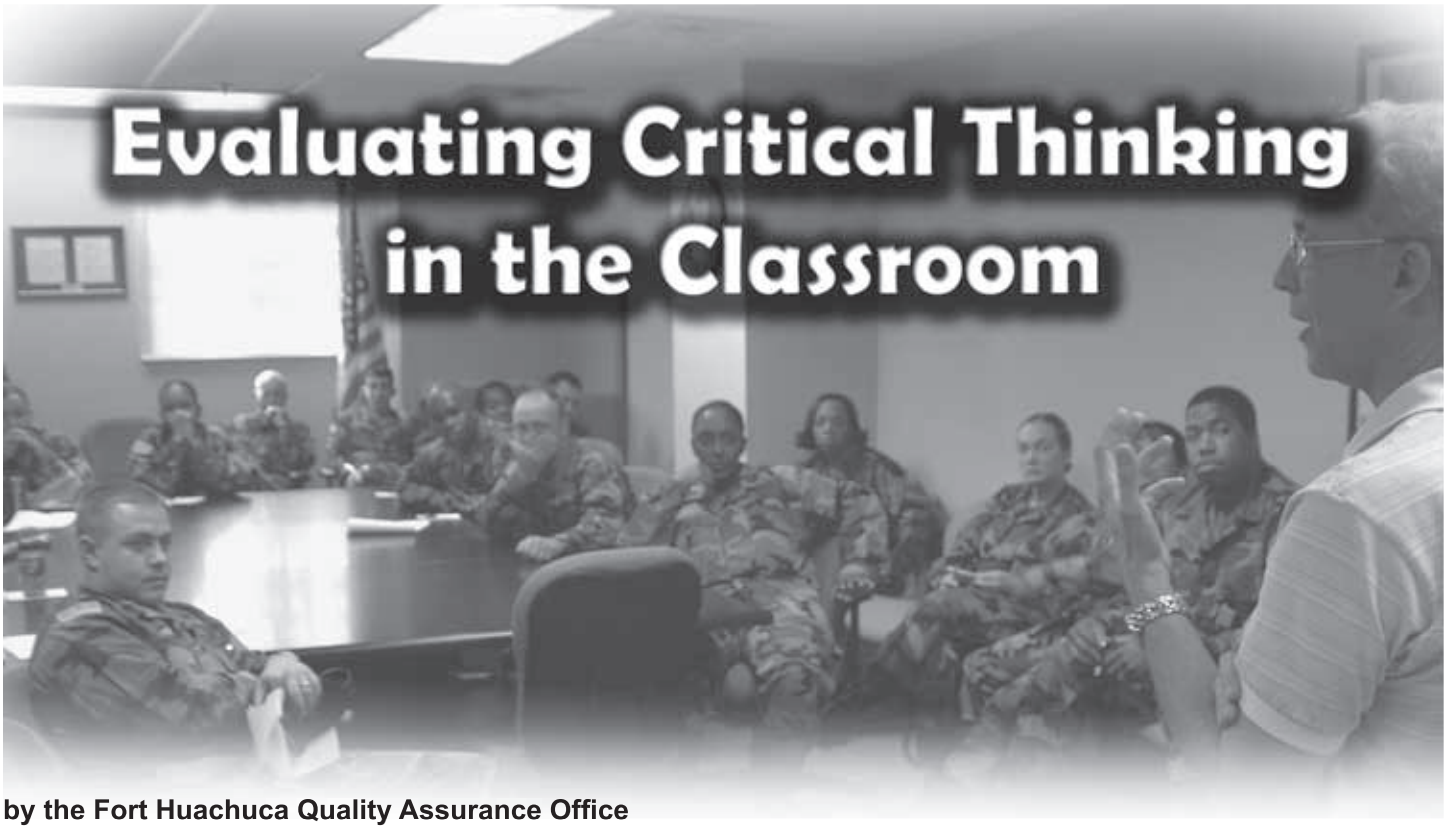

by the Fort Huachuca Quality Assurance Office

Critical thinking is the process of analyzing and evaluating thinking with the idea of improving it and taking it to a higher level. Critical thinking is key to the decisionmaking process and should measure the students' ability to formulate questions clearly, gather information using abstract ideas, develop sound conclusions, think without bias, and communicate effectively to figure out difficult problems. All thinking needs to be assessed for quality and can be accomplished by applying a set of standards: clarity, accuracy, precision, fair-mindedness, objectivity, and logic.

Rather than creating a whole new set of lesson plans and supporting materials, an instructor can incorporate critical thinking into existing materials. The first step in this process is to attend the 111th Military Intelligence Brigade Office of the Dean's pilot Critical Thinking class which discusses theory and provides the instructor with a practical exercise, wherein he/she modifies an existing lesson plan to encourage critical thinking in class. This may be as simple as rewriting existing class checks to challenge the students to solve a problem or do some analysis versus repeating key points the instructor just covered. Then, as more instructors in a particular course attend the Critical Thinking class, more of the course's lesson plans can be modified to engage the students in critical thinking throughout the instruction rather than waiting until an end-of-course practical exercise to help students "connect the dots" of key teaching points.

The evaluators in the Quality Assurance Office (QAO) currently use the 111th MI Brigade's Instructor Performance Evaluation Form and the Classroom Evaluation Checklist during our regular classroom monitoring. Both of these forms were developed using a Brigade-led tiger team of trainers, training developers, education specialists, training specialists, and evaluators. The checklist (see next page) is a separate means of assessing whether the instructor is using effective questioning techniques to encourage critical thinking in the classroom. Pending validation of the Dean's Critical Thinking class, QAO will again participate in the tiger team process with the goal of updating the standardized classroom monitoring forms to reflect an assessment of the incorporation of critical thinking into training.

Instructor Questioning Techniques

Does the instructor use questioning techniques effectively to strengthen student abilities to apply the elements of critical thinking? Effective Questioning leads to the desired student Learning Outcomes. Are the questions *engaging students to find insights* into their own thought processes? Are the questions asked throughout the lesson in a *timely (relevant) and consistent manner*? Are the questions presented from *simple to a deeper complexity*?

STUDENT LEARNING OUTCOMES FOR DEMONSTRATING CRITICAL THINKING **Effective Questioning?**	**Yes**	**No**	**N/O or N/A**	**See Remarks**
1. CLEARLY state the significant problem, its goals/objectives. Sample Questions: What do you need to accomplish? What is the main purpose? What are the concepts involved? Are you stating it clearly?				
2. ACCURATELY assess that sufficient information has been gathered to answer the problem goals to the correct breadth, depth, and validity. Sample Questions: What information do you need to collect? How much is enough? Have you checked your sources adequately and fairly? What new questions did the information raise? Are there any other perspectives to consider? What are the facts pertinent to making an informed guess/plan? Do you need to verify your data further? What is the best way to verify the data?				
3. PRECISELY identify assumptions; determine if they are justifiable. Sample Questions: What are you taking for granted? What assumption(s) led you to that conclusion? What are the assumptions others have about the situation?				
4. FAIRMINDEDLY identify all points of view (strengths and weaknesses). Sample Questions: What is your personal point of view about problem/ issues? What other points of view are there? How might your point of view color your decisions?				
5. OBJECTIVELY infer only what the data implies. Sample Questions: How do you know you have remained objective in your inferences? Have you used correct logic in making your inferences?				
6. LOGICALLY consider all possible consequences and implications of the results of reasoning. Sample Questions: What are the consequences of your conclusions from all points of view? Are there multiple implications from your decisions? Who will the implications affect and how? How will possible consequences affect you and others?				
Remarks on Instructor Performance:				
Remarks on Student Reactions:				

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THE USAIC INSTRUCTOR TRAINING COURSE

by Joann Kiyabu

What does the U.S. Army Intelligence Center's (USAIC) Instructor Training Course (ITC) have to do with Critical Thinking? In the ITC (hosted and taught by the Staff and Faculty Division) students are taught the basics of instruction to successfully complete their assignment as trainers throughout USAIC and Fort Huachuca. After thirteen days of training, practical exercises, and two graded instructional presentations, students possess the core skills to write and present Critical Thinking lessons using lecture, demonstration, and practical exercise methods of instruction.

Early in the course, students are exposed to test development, and learning objective and lesson plan development from the viewpoint that training should be realistic and challenging. Once the mechanics of developing criterion-based learning objectives, based on clearly defined standards that measure training at the appropriate cognitive level are learned, the students are ready to develop a learning objective. Students complete a practical exercise during which they use Critical Thinking to analyze a given topic and figure out what the end state or core skills should be and write a learning objective that matches the desired end state.

From that point, ITC students select a military topic for a lecture, prepare a measurable and observable objective, and prepare a lesson plan and slideshow from which they present a thirty minute lecture. They receive training in questioning techniques as part of the course and are encouraged to include scenario based and/or probing questions in their lesson plans and presentations to actively engage students in the learning process. Incorporating these types of questions into their training materials right from the start of ITC requires rudimentary Critical Thinking skills that the new instructors will hone as they mature during their instructional assignments.

Students also receive instruction and complete a practical exercises in the areas of cultural awareness and the contemporary operating environment with the intent that they will incorporate those two aspects in their lesson plans as well. Once they receive a passing grade on the lecture presentation, and instruction on demonstration and practical exercise methods of instruction, students develop and present a fifty minute training session that includes a demonstration followed by a student centered practical exercise.

After students graduate from the ITC they return to their units to instruct within an Intelligence School course and in a subject in which they are subject matter experts. Ideally, the new instructors will have mentors who will work with them to develop lesson plans that incorporate Critical Thinking and improve their performance as instructors.

Incorporating Critical Thinking into training starts with determining what core skills you want your students to possess when they leave your lesson/module/course and then writing your objectives to match. You need solid criterion-based objectives written at the appropriate cognitive level using some type of taxonomy. The U.S. Army Training Command (TRADOC) Pamphlet 350-70-5, Systems Approach to Training: Testing, recommends using Bloom's Taxonomy for developing testable objectives.

It is critical that those of us who teach the ITC prepare the new instructors at Intelligence Center for their mission of training the soldiers who may deploy to a war zone shortly after completing their courses. To get students to the critical and creative thinking levels that are so important for them and their future missions, objectives need to be written at the higher levels of Bloom's Taxonomy. At the ITC, we stress that as part of their course work, the students should be applying, analyzing, synthesizing, or evaluating intelligence and intelligence products. It is the instructor's responsibility to develop training materials that support those types of Critical Thinking activities.

Joann Kiyabu is an Instructional Systems Specialist with the Staff and Faculty Division at USAIC, Fort Huachuca, Arizona and is the Course Manager and Instructor for the Test Development Workshop. She also teaches in the Instructor Training Course (ITC) and the Systems Approach to Training (SAT) Course and is a former Course Manager and Instructor for the Small Group Instructor Training Course (SGITC). Ms. Kiyabu's other DA civilian and contractor assignments include Chief, Course Development Branch; Training Specialist at the MI NCO Academy; and Technical Editor for Wang Government Services. Ms. Kiyabu is a retired U.S. Army 98G, Korean Linguist, with assignments that included Production and Support Analysis Team Member, 741st MI Battalion, and Collection Supervisor, 2nd Infantry Division and 125th Infantry Division. Ms. Kiyabu is a Master Instructor and holds an MA in Educational Psychology from the University of Arizona. Readers may contact her via email at joann.kiyabu@us.army.mil

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Employing Critical Thinking Skills in the USAIC JI-CTC

by Major James W. Reed

The Joint Intelligence Combat Training Center (JI-CTC) provides a one-week, Iraq-based battle simulation called Exercise Eagle 2 designed to immerse students at the U.S. Army Intelligence Center (USAIC) in realistic battalion or brigade Tactical Operation Center (TOC) missions or a division Analysis and Control Element (ACE) mission. The purpose of this experience is to allow students to practice performing the following core Military Intelligence (MI) competencies necessary in a deployed environment:

- ❑ Situation development.
- ❑ Target development.
- ❑ Combat assessment.

Normally, students attend JI-CTC two weeks prior to graduation from a formal MI training course of study. Whereas it is expected that students will come to the JI-CTC fully prepared to participate in Exercise Eagle 2, the reality is that many will find it necessary to strengthen their Critical Thinking (CT) skills in order to successfully complete the program. In general, they do this with enthusiasm.

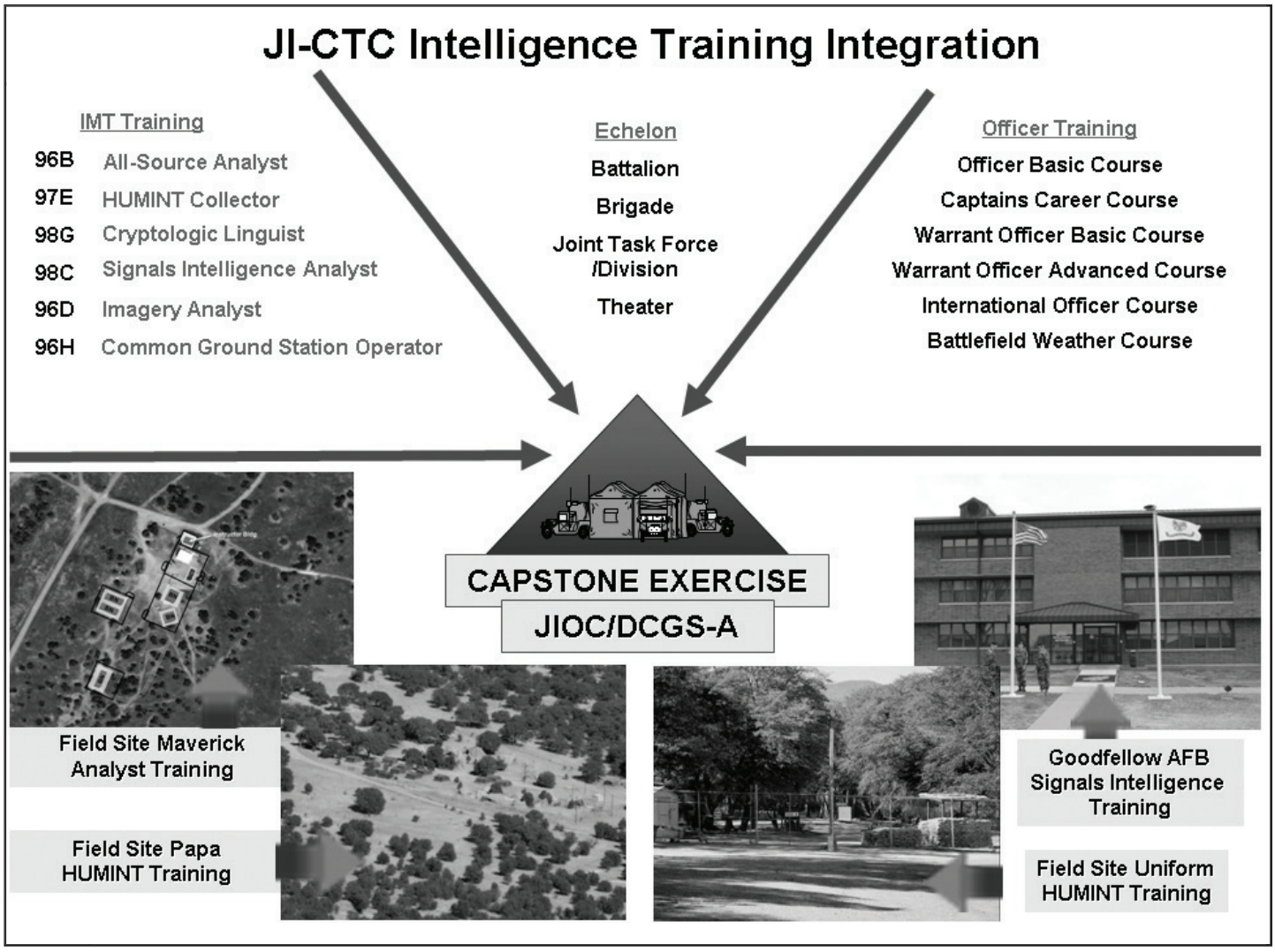
The level of difficulty in Exercise Eagle 2 requires that students engage in CT skills at the macro level, becoming fully engaged in the learning experience. Unlike other Army Combat Training Centers, which employ Observer/Controllers who have minimal interaction with participants, the JI-CTC relies on Observer/Trainers who serve as mentors to guide students throughout the exercise. The Observer/Trainers consistently challenge students to follow the tenets of scientific inquiry by encouraging them to pose and test hypotheses designed to produce intelligence products. In the case of a task such as “Write an Intelligence Summary”, Observers/Trainers explain the task to completed (hearing), provide a sample product (seeing and modeling), and then supervise until the student completes the task (doing). At the micro level, JI-CTC Observer/Trainers develop and follow formal, approved lesson plans and learning objectives that incorporate lessons learned from Iraq and focus on active student participation in the problem solving process. Students are not merely passive recipients of knowledge. Instead, they are fully engaged in the learning experience.

Are students being challenged to articulate problems, pose, and test hypotheses and make decisions? The answer is that scientific inquiry, problem solving, and decision making are clearly integral to the JI-CTC experience. It may be argued that young Soldiers new to the U.S. Army (primarily lieutenants and privates) who have not deployed to a war zone have little to no “concrete experience” to draw from. The JI-CTC experience has shown that all Soldiers, regardless of rank, are capable of effectively demonstrating these skills. For example, students must conduct a daily targeting update where they nominate enemy targets to their Observer/Trainer. Before they can do this, they must have:

- ❑ Used their intelligence collection assets, such as a HUMINT Collection Team, to collect specific intelligence data on the potential target to create link diagrams and pattern analysis charts (scientific inquiry).
- ❑ Determined where the target terrorist is within the hierarchy of the insurgent network (problem solving).
- ❑ Decide whether to nominate the target as a lethal target or non-lethal target (decision making).

At the JI-CTC, constant daily scientific inquiry requires students to put much more effort into the learning process than in other parts of their training, which results in a tremendous value for the students who often cite Exercise Eagle 2 as the most challenging and rewarding part of their training while at Fort Huachuca.

The JI-CTC is intended to serve as a culminating and integrative experience for MI students through which they are offered an opportunity to practice, in a realistic setting, the skills of analysis, synthesis and scientific inquiry that they have learned throughout their formal training at Fort Huachuca. Presently, key JI-CTC personnel participate in a four hour block of instruction designed to strengthen CT skills across the entire USAIC curriculum. The JI-CTC will increasingly serve as the final opportunity to ensure that all MI professionals trained at USAIC are able to effectively employ the basic tenets of CT in order to win in the Global War On Terrorism.



Major Reed currently serves as the JI-CTC Officer-in-Charge at Fort Huachuca, Arizona. Previous assignments include Brigade S2, 18th Military Police Brigade, Mannheim, Germany; G2 Operations Officer, V Corps, Heidelberg, Germany; Company Commander and Battalion S2, HHC, 96th Civil Affairs Battalion; Battalion S2, 96th Civil Affairs Battalion, Fort Bragg, North Carolina; Detachment Commander and Battalion S2, HHD, NTC Support Battalion; Detachment XO, C Detachment, 203D MI Battalion, and Assistant RS2, 11TH ACR, Fort Irwin, California. He holds a BA in Religious Studies from California State University at Chico. Readers may contact Major Reed at james.reed@us.army.mil.

The Automated Systems Approach to Training Goes Lean

by George Stemler

Introduction

The Lean Six Sigma concept, as adapted by the U.S. Army, is a combination of two business improvement techniques, *Lean* and *Six Sigma*. Lean focuses on systematically eliminating all forms of waste in the manufacturing process and Six Sigma focuses on process improvement while decreasing process variation. The combination of the two, Lean Six Sigma, integrates time management and process improvement. [1]

The 309th Military Intelligence (MI) Battalion is a U.S. Army Training and Doctrine Command (TRADOC) unit responsible for training both Military Occupational Specialty (MOS) and functional course Soldiers. Training Soldiers to be both tactically and technically proficient in today's asymmetric threat environment is resource intensive and expensive. Therefore, it is imperative that the battalion accurately identify and document its resource requirements. The battalion documents its course specific resource requirements through the TRADOC automated resource management process.

The Automated System Approach to Training (ASAT) system is part of the TRADOC Institutional Training Resource Model (ITRM). See Figure 1. The ASAT database is the primary resource data documenting system used by the battalion. The data loaded into ASAT produces two of the three Training Requirements Analysis System (TRAS)[2] documents used by ITRM. The TRAS documents help isolate and determine training costs for individual courses of instruction. The two primary TRAS documents produced by ASAT data are the Course Administrative Data sheet (CAD) and the Program of Instruction (POI). A third TRAS document, the Individual Training Plan (ITP), is not produced from ASAT data, but is part of TRADOC's resource documentation scheme.

Applying Lean to the ASAT Process

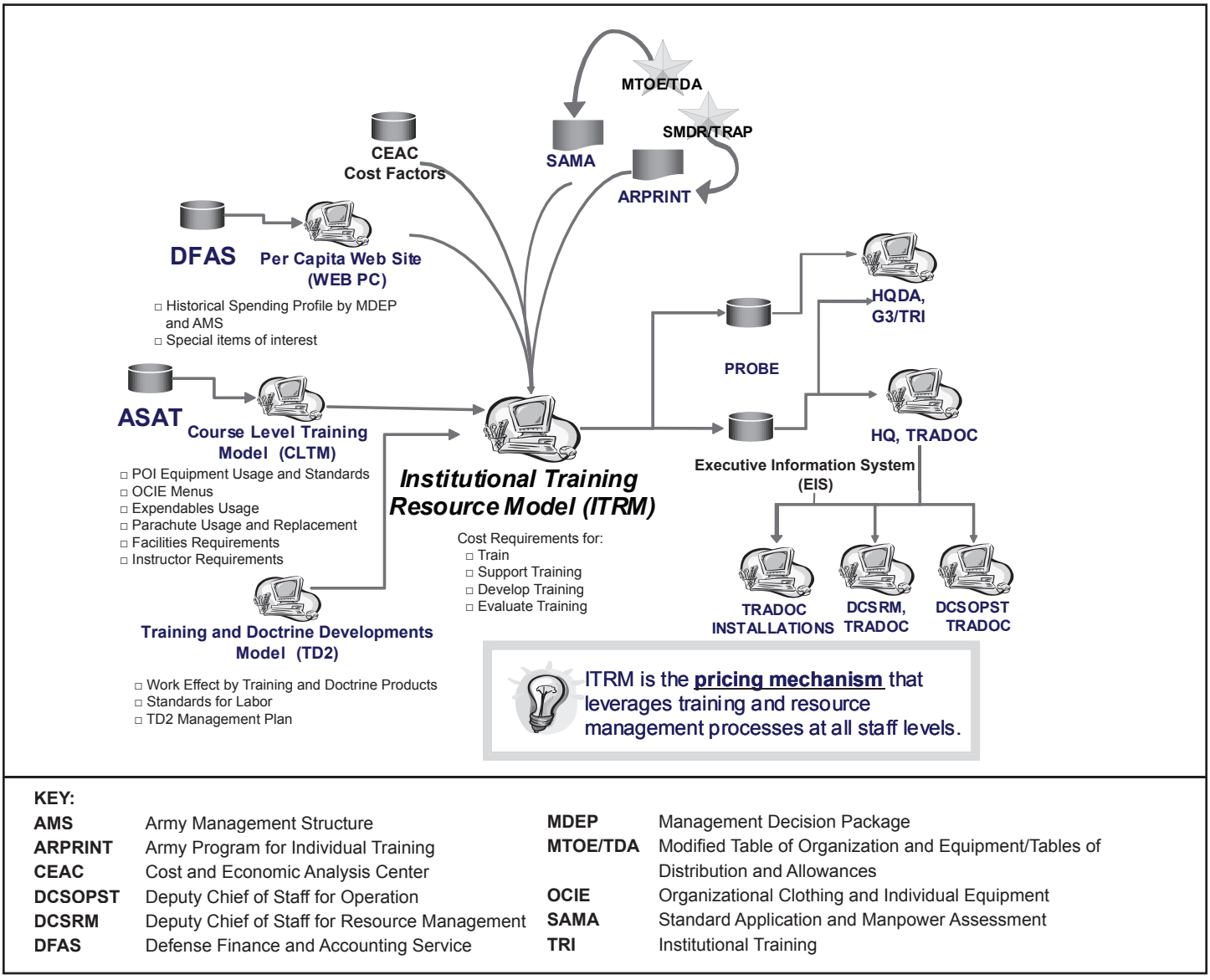
To apply Lean concepts to the battalion's ASAT business process three basic Lean principles [3] were applied:

1. Let the customers say what is of value to them.

2. Reduce no-value adding activities in the system, causing process speed to increase.

3. Faster process speed is directly related to less waste, less cost, less Work In Process (WIP), less complexity, higher quality and happier customers.

The battalion's primary ASAT data end-user is TRADOC, and TRADOC is primarily interested in using the data to determine the cost of doing business. A lesson plan, inputted into ASAT, is the base document upon which TRADOC formulates the resource requirements for all TRADOC courses. Lesson plan data provides TRADOC with another documented resource requirement for items such as instructors, facilities, equipment, ammunition, training aids, and other costs in direct support to the training event (e.g., bus drivers, medics, role players, vehicles, etc.).



KEY:

AMS	Army Management Structure	**MDEP**	Management Decision Package
ARPRINT	Army Program for Individual Training	**MTOE/TDA**	Modified Table of Organization and Equipment/Tables of Distribution and Allowances
CEAC	Cost and Economic Analysis Center		
DCSOPST	Deputy Chief of Staff for Operation	**OCIE**	Organizational Clothing and Individual Equipment
DCSRM	Deputy Chief of Staff for Resource Management	**SAMA**	Standard Application and Manpower Assessment
DFAS	Defense Finance and Accounting Service	**TRI**	Institutional Training

Figure 1. Institutional Training Resource Model (ITRM)

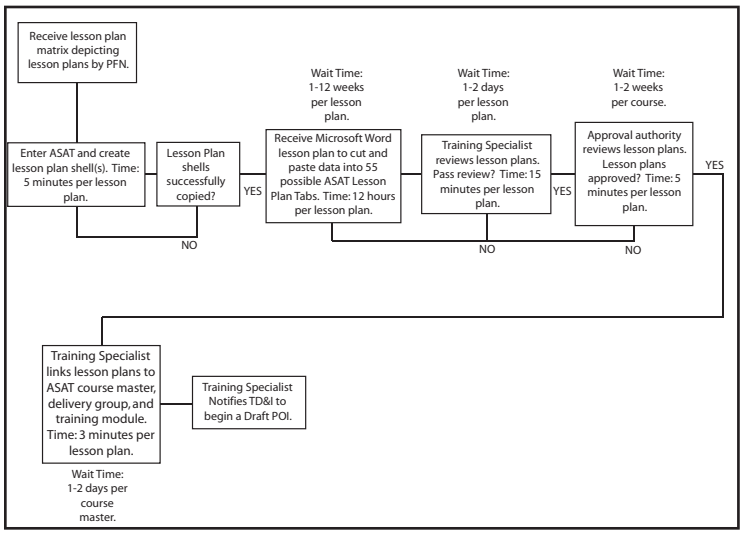


Figure 2. Lean Value Stream for ASAT lesson plan data entry process.

Populating the ASAT database was time consuming and labor intensive, so much so that the courses within the battalion actually avoided using ASAT. Because the ASAT database is linked directly to the ITRM database, ASAT data input avoidance increased the probability of inadequate resources for Mission Essential Task List (METL) execution.

A Lean Value Stream (Figure 2) was constructed to depict the battalion's current ASAT data entry process, and determine the no-value added activities associated with the ASAT process. An analysis of the Lean Value Stream helped to identify the amount of WIP and the largest time wasted in the current ASAT data process. Identifying these trouble areas was the initial step in retooling the entire ASAT database process across the battalion.

Through brainstorming and analysis of the Lean Value Stream an ideal Lean Value Stream (Figure 3) was developed. The new Lean Value Stream targeted the unnecessary activity and remedies as much wasted time as possible to speed up the entire process. By implementing an entirely new Lean Value Stream (process), the battalion was able to save approximately 2,124 WIP hours or 1.22 man-years in direct labor costs (Table 1).

The times in Table 1 are approximate due to the individual nature of ASAT data entry and the complexity of individual lesson plans. The labor savings derived from the new Lean process were applied directly to training in the classroom, field training exercises (FTXs), course development, and courseware maintenance. Therefore, the "bother to worth" of incorporating Lean concepts into the battalion's ASAT database process immediately began to pay off.

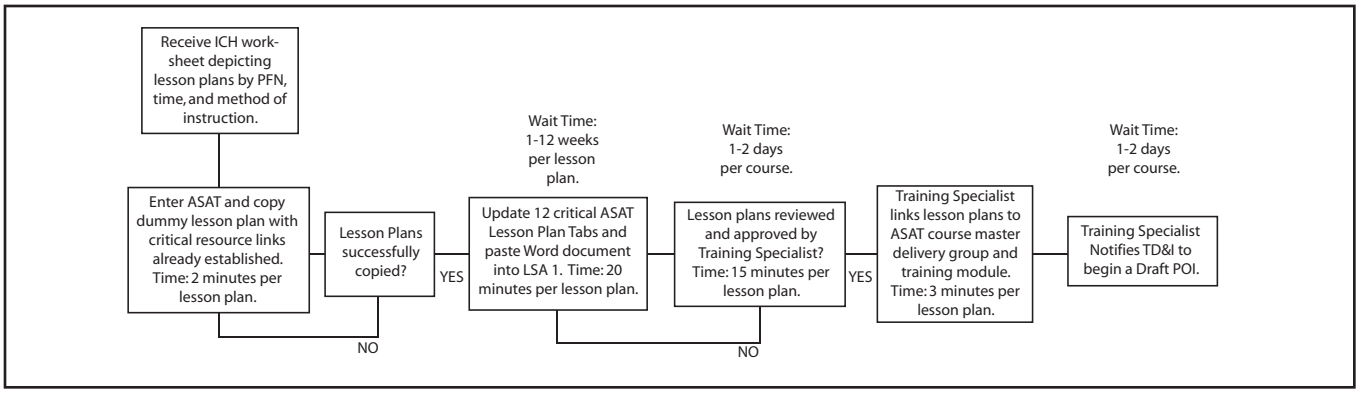


Figure 3. Current Lean Value Stream for ASAT lesson plan data entry.

Table 1. Approximate Lean Value Stream WIP savings in hours

Course Title	Number of Lesson Plans	WIP (hours) before Lean Six Sigma 4 (approximate)	WIP (hours) after Lean Six Sigma 5 (approximate)	Savings in WIP hours (approximate)
***Intelligence Analyst Course**	25	312	17	295
***Ground Surveillance Operator Course**	18	224	12	212
Human Intelligence Collector Course	59	736	40	696
Counterintelligence Special Agent Course	21	262	14	248
Source Operations Course	17	212	11	201
***Intelligence in Combatting Terrorism**	15	187	10	177
*** Communications Locator/ Interceptor (Manual Morse)**	13	162	9	153
***Prophet Operator Course**	12	150	8	142
Battalion Totals:	**180**	**2245**	**121**	**2124**

Note: *No longer part of the 309th MI Bn

Applying Six Sigma through the International Organization for Standardization 9001

The International Organization for Standardization 9001 concept of *Plan, Do, Check, Act (PDCA)* [6] in conjunction with Kaoru Ishikawa's 4Ms[7] (Material, Machines, Methods, and Manpower) were employed to achieve the battalion's **Six Sigma goal of** quality and variability reduction. The implementation, briefly explained, includes:

- ***Plan (Material, Machines, Methods, and Manpower)***

  1. The *materials* required to produce relevant ASAT data (lesson plans) were not a factor because hard copy (paper) lesson plans are not required for ASAT data entry. In fact, soft copy versions of the Microsoft Word lesson plan format are the requirement due to the "cut and paste" nature of the ASAT data fields.

2. The *machines* required for ASAT also were not a major factor. ASAT's only requirement is a desktop/laptop computer capable of running the ASAT software version 4.4 and Intranet access to the ASAT server. Every battalion employee involved with ASAT data entry had ready access to a desktop/laptop computer.

3. The ASAT *methodology* was different from course to course, so the variability of the database was wide-ranging as well. Some courses were entering too much data and some courses were entering nothing at all, and all courses were making data entry mistakes. Therefore, a standard method of populating the ASAT database was required. The battalion standardized ASAT job aids, and mandated the following three major ASAT business processes.

a. *Create and maintain an up-to-date Instructor Contact Hours (ICH) worksheet, reflecting the Program of Instruction File number (PFN), methods of instruction, time per method, number of student groups per method, number of instructors per method.* The ICH worksheet is now the base document for all ASAT data entry and is used to trouble-shoot potential ICH and academic hour differences found in an ASAT POI report.

b. *In ASAT, create two lesson plan templates (one for classroom training and one for field training).* The templates are pre-linked to critical ASAT resource records reflecting all equipment, facilities, personnel, ammunition, and training aids required in a classroom or field training environment. In addition, replicate every method of instruction per the ICH worksheet, within the Terminal Learning Objective tab. The template will reflect the correct foreign disclosure statement and any pertinent course administrative remarks. The templates are copied as many times as required to correspond with the number of lesson plans reflected on the ICH worksheet. Because the templates are pre-linked to the equipment, facilities, personnel, ammunition, and training aid requirements, hundreds of WIP and labor costs are saved.

c. *Cut and paste the entire Microsoft Word lesson plan, produced earlier in the process and used in the classroom, into the Terminal Learning Objective Tab's Learning Step Activity-1.* This ensures the actual lesson used by the trainers is available to authorized ASAT users.

❑ ***Do implement the process.***

The battalion Training Specialist implemented the new ASAT business processes with immediate and positive results. The ASAT WIP decreased from approximately 2,245 hours to a WIP approximately 141 hours per year. The WIP reduction also resulted in a decrease in the time to produce a TRAS document. As a result, the currency and relevancy of the battalion's TRAS documentation improved immediately. The new process ensures current and relevant resource data is always readily available to TRADOC.

ASAT software is confusing, therefore, the battalion Training Specialist controls and grants access to the ASAT database to a select few individuals within each course of instruction. The Training Specialist conducts on-demand ASAT training, and can train most battalion ASAT users within two to three hours. The on-demand training strategy, coupled with limited ASAT access, is cost effective and negates the need for the ASAT user to attend an ASAT training course outside the battalion.

❑ ***Check on the process.***

The battalion Training Specialist is the single point of contact for ASAT within the battalion and monitors and measures the success of battalion ASAT processes and products while ensuring local and TRADOC ASAT policies and objectives are adhered to and achieved. The battalion's ASAT business processes are included in the formal battalion Command Inspection Program (CIP), which ensures at least an annual review for all courses.

❑ ***Act on process improvement.***

The battalion Training Specialist proactively seeks process improvement by encouraging battalion ASAT users to find new time saving processes to improve the battalion's ASAT strategy. As a result, the battalion has been able to maintain a positive synergy, keeping the battalion ASAT business processes current and efficient.

Conclusion

The application of Lean Six Sigma concepts to the ASAT database process enabled the 309th MI Battalion to demonstrate a significant savings in time, cost, and product improvement. The battalion's Lean Value Stream analysis pro-

duced a reduction in WIP, while ensuring lesson plan resource data was accurately represented and available to the TRADOC ITRM database. With the TRAS documents current and the ITRM data accurately reflected, the battalion is always postured to receive its required share of limited TRADOC funding.

While it is imperative that the resource data mechanisms are accurate, the savings in labor or WIP was an obvious benefit of the Lean Six Sigma concepts. The WIP savings were applied directly to the battalion's Structure Manning Decision Review (SMDR) requirements, where there is an on-going labor requirement.

The new Lean Six Sigma process helped end ASAT data entry resistance throughout the battalion. Every course, within the battalion, now ensures its ASAT database requirements are current and reflect its resource requirements. The new attitude towards ASAT data entry is a complete turn around to the fierce resistance that accompanied the old ASAT data entry processes.

Training Soldiers to survive and thrive in today's asymmetric threat environment is the 309th MI Battalion's priority training mission, and the integration of Lean Six Sigma concepts into its business processes helps to ensure the battalion performs its mission effectively and efficiently.

Endnotes

1. Stephen A. Rooney and James J. Rooney, "Lean Glossary," *ASQ Quality Progress*, 38: 6, June 2005, 41-47.

2 **TRADOC Pamphlet 350-70-8, Total Army School System (TASS) Training Requirements Analysis System (TRAS),** Department of the Army, 1 November 1996.

3. Len Tischler, "Bringing Lean to the Office," *ASQ Quality Progress*, 39: 7, July 2006, 32-38.

4. Formula for WIP before Lean = $\frac{\text{748 WIP Hours X (Total Lessons in Course)}}{\text{60 Minutes}}$

5. Formula for WIP after Lean = $\frac{\text{40 WIP Hours X (Total Lessons in Course)}}{\text{60 Minutes}}$

6. Praveen Gupta, "Beyond PDCA A New Process Management Model,**"** *ASQ Quality Progress*, 39: 7, July 2006, 45-52.

7. Ibid., 45-52.

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The Army Intelligence Comprehensive Analysis Tool

by Mr. Wesley M. Good (Master Sergeant, U.S. Army, Retired)

Consider that you are assigned to a Brigade Combat Team S2 section, or a Military Intelligence Company (MICO), and want to learn more about the unit's mission and tasks. Or, perhaps you work in the MI Battalion S3 section and have been given the task to develop a training plan with collective and supporting individual tasks. Where can you go to get help? The Integrated Intelligence, Surveillance, and Reconnaissance Force Development Test/Experimentation (I2SR FDT/E) Team, in conjunction with the U.S. Army Intelligence Center (USAIC) Chief Information Officer (CIO)/G6, has created the Army Intelligence Comprehensive Analysis Tool (AICAT) to meet these needs.

The I2SR FDT/E team was chartered in the summer of 2003 to assist the senior leadership of USAIC in assessing the ability of future MI organizations to satisfy the information and intelligence needs of commanders, shooters, and other decision makers. The core function of the I2SR FDT/E team is to answer the following questions:

How well do the proposed ISR concepts of operation and organizational designs answer the commander's information and intelligence requirements?

Does the Concept of Operations support the integration of ISR at all levels of the Army?

Does the organizational design provide the unit with the capability to accomplish its tasks?

Does the unit have the right personnel and equipment to accomplish its tasks; not just in numbers, but in skills and training too?

The team's primary mission is to provide quantifiable, data driven analysis to validate concepts operation and force structures of re-setting future MI organizations. Current operations have mandated an accelerated transition to modular designs. With the rapid transformation comes the risk that the redesigned MI Force has unforeseen second– and third–order effects; these effects may prevent MI organizations from adequately satisfying the commander's information and intelligence needs. The I2SR FDT/E team is designed to assess and mitigate this risk. The team accomplishes its mission by conducting tests, experiments and field assessments of re-setting units to assess the effectiveness of existing or new products of DOTMLPF (Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities). The results of the team's efforts assist a wide range of USAIC agencies in defining and refining concepts of employment, operation, logistics, training, organization, personnel, and policies. The team employs the following four primary lines of operation in the conduct of its mission:

1. Develop and maintain the AICGM (Army Intelligence Comprehensive Guide to Modularity), a baseline document that describes the operational concepts, objective organizational designs, and troop-to-task lists for modular MI organizations.

2. Develop the AICAT to enhance the team's research and analysis capabilities and to support concepts and requirements development, experimentation, and doctrine and training development.

3. Conduct IMPRINT (Improved Performance Research and Integration Tool) modeling of future MI organizations in support of experiments and exercises changing DOTMLPF variables.

4. Conduct Field Assessments of re-setting MI units to assist in forming the training, doctrine and capabilities development processes.

The AICAT grew out of a research requirement for the I2SR FDTE team. Its functionality and potential quickly generated interest and demonstrated utility beyond the originally intended purpose. Expanded to meet the reference and research needs of the entire MI community, AICAT is a web-based tool that allows the community to rapidly research and assemble ISR training, organizational design, doctrine, and requirements information from various available sources to support Army transformation force development needs. The project development and implementation process is both phase and spiral based, consisting of Baseline, Assessment, Trends Comparison and Risk Analysis tools.

To access AICAT use your Army Knowledge Online (AKO) login and password to access the ICON Portal at https://icon.army.mil/ and select "Click to Login." Inside ICON, click on "AICAT" in the lower left side under "Public Apps". Once in the AICAT web site, users have Guest level access. Users can request elevated access by locating "User Tools" on the left, selecting "Request Access," and filling out the Request Access Form. Once inside AICAT, there are subsections dedicated to different purposes, such as the Baseline and Document Management System (DMS) sections.

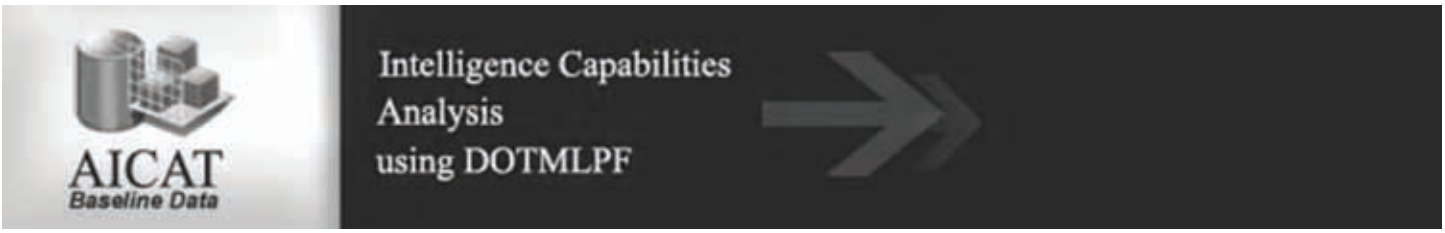
The Baseline portion of AICAT contains codified and standardized reference material from which all other material is derived. The AICGM represents the objective force structure and associated task crosswalk for MI in the transformation force. Users can query Chapter 5 of the AICGM which contains operational concepts, section tasks, personnel, and MI equipment. The "Task" tab contains MI Soldier individual, collective tasks, and associated Army Universal Task List (AUTL) tasks as well as system tasks (e.g., Prophet). All tasks originate from the Army Systems Approach to Training (ASAT) database maintained at the Intelligence Center. Both the AUTL and the Universal Joint Task List are databased in the "AUTL/UJTL" tab in AICAT, and are keyword searchable. User queries can be saved in the "My Favorites" area, as an Adobe Acrobat .PDF, or in tab delimited .txt format for further manipulation in MS Excel and MS Access. These Baseline elements provide the foundation for further refinement in training, concepts, exercises, and gap analysis.

The AICAT DMS provides a repository where various MI related documents are stored in categories with appropriate protection levels. This system will allow users to search and browse the large collection of stored documents. Search functionality allows users to perform full text searches of documents, spreadsheets, .pdf files, PowerPoint presentations, and the baseline databases. Search results are returned by category. Users are then able to view, bookmark, and save documents to their local computers.

The DMS "Browse Documents" functionality allows users to navigate the repository's document folders, accessing only the authorized documents determined by their security role. Users can choose to download multiple documents in a single folder at one time by clicking the checkboxes and hitting Download File(s). The documents will be automatically zipped to ensure a quicker download. Users are able to submit documents into AICAT using the "Submission Form" feature found on the initial DMS screen. The "Workgroup Documents" provides group administrators the ability to create project folders, assign specific users, and to upload or download privileges to the folder. Folders are not searchable via DMS search. Upon completion of a product, the workgroup approving authority can release the document(s) for publication, which will then be published to AICAT DMS for access based on applicable restrictions.

Spiraled and phased uploads to the baseline section of AICAT include MI related Tables of Organization and Equipment (TOEs) and Modified TOEs, Missions, and Drills. The Assessment Database and Trends and Analysis Database are also planned as part of spiral development. Both of these modules will assist the MI community in standardizing data collection during field assessments, in documenting observations obtained at actual field exercises or through lessons learned, making information obtained from these venues more accessible and useful.

Below are some baseline query vignettes that may help users in accomplishing unit mission functions.



Screen save of baseline data

- **METL Development:** AICAT provides reports that link AUTLs to collective tasks and the supporting individual tasks. Just go to the 'Task' tab and select 'AUTLs to Col to Ind Tasks', type in "MOS" as your filter (ex: "96B") and select 'Display Grid'. You will be given a list of tasks required for your Military Occupational Specialty (MOS).
- **MI Unit Training Development**: If you are assigned to a brigade and need a list of collective tasks and the supporting individual tasks to develop training for MI Soldiers in your section, go to 'Collective to Individual Tasks' and type "BDE" in the 'Keyword Search' box. You will be given a full list of tasks for your section.

Beyond these examples, AICAT has demonstrated utility for training development applications, doctrine and emerging concepts research, and collaborative working group functionality.

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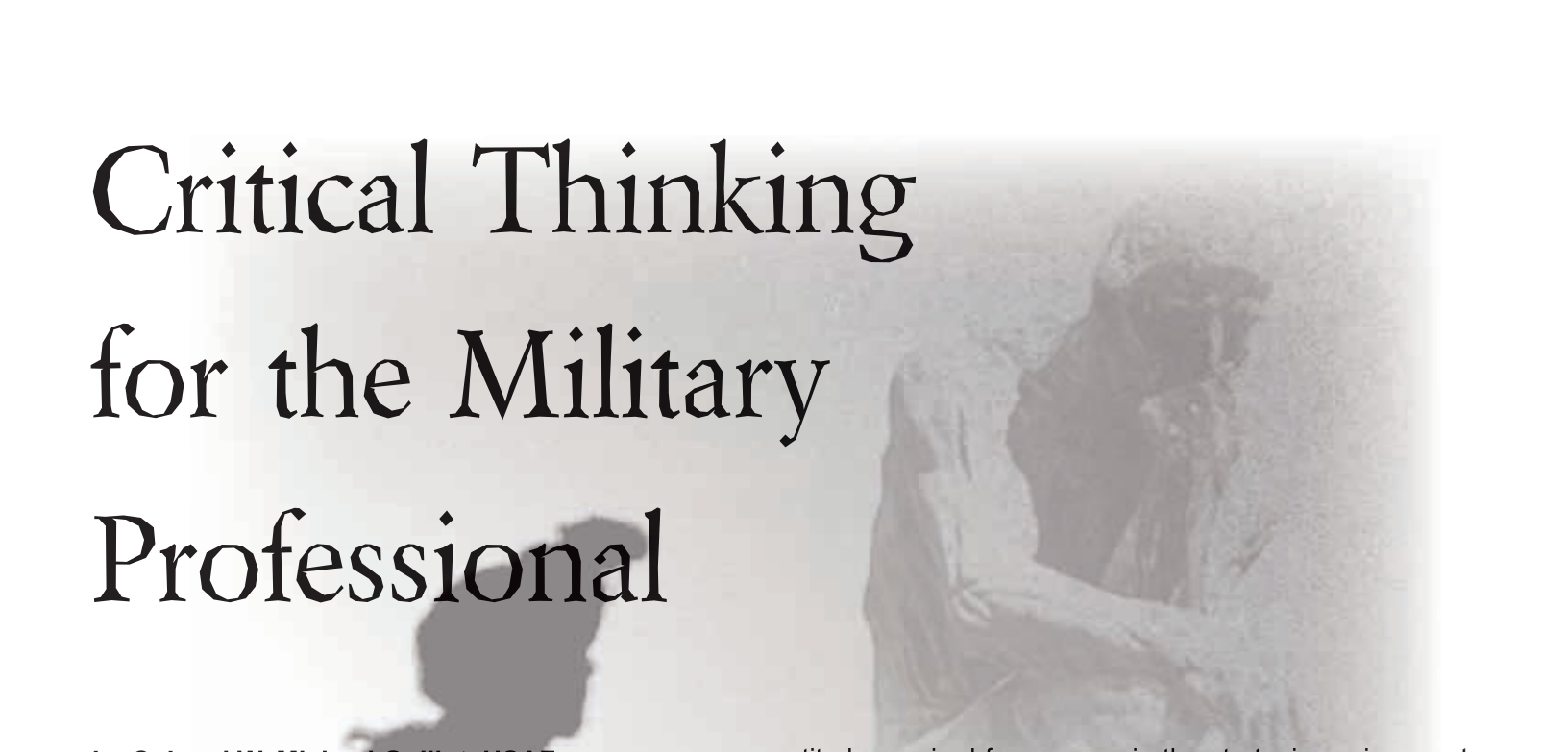
Critical Thinking for the Military Professional



by Colonel W. Michael Guillot, USAF

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Introduction

"Any complex activity, if it is to be carried on with any degree of virtuosity, calls for appropriate gifts of intellect and temperament . . . Genius consists in a harmonious combination of elements, in which one or the other ability may predominate, but none may be in conflict with the rest."[1]

–Carl Von Clausewitz, On War

In a previous article on Strategic leadership I described the strategic environment as volatile, uncertain, complex, and ambiguous (VUCA). Additionally, that writing introduced the concept of strategic competency.[2] This article will discuss the most important essential skill for Strategic Leaders: critical thinking. It is hard to imagine a Strategic leader today who does not think critically or at least uses the concept in making decisions. Critical thinking helps the strategic leader master the challenges of the strategic environment. It helps one understand how to bring stability to a volatile world. Critical thinking leads to more certainty and confidence in an uncertain future. This skill helps simplify complex scenarios and brings clarity to the ambiguous lens. Critical thinking is the kind of mental attitude required for success in the strategic environment. In essence, critical thinking is about learning how to think and how to judge and improve the quality of thinking—yours and others.

Lest you feel you are already a great critical thinker, consider this, in a recent study supported by the Kellogg Foundation, only four percent of the U.S. organizational population was considered highly competent in strategic thinking.[3] When it comes to thinking itself, there are still a number of myths to contend with. For instance:

-Thinking is natural and you don't have to think about it to do it well–you do!

-Thinking skills and intelligence are synonymous–they aren't!

-Bright people should just know how to think well together–they don't![4]

The grand master of military strategy and leadership, Carl Von Clausewitz, thoroughly embraced the value of critical thinking in his writings concerning military genius. Clausewitz advised, *"*What we must do is to survey all those gifts of mind and temperament that in combination bear on military activity,*"*[5] Also consider the challenge presented to all the military departments by Secretary of Defense Rumsfeld when he called for leaders who were proactive, more like venture capitalists, and deal with uncertainty—those unknown, unknowns.[6] Critical thinking is required to address this kind of challenge.

To understand the concept of critical thinking, first one must try to define it—what it is and what it is not. Next, the prospective critical thinker must study the topic to develop critical thinking skills. This paper will present a very useful construct or model for learning how to think critical-

ly and how to use critical thinking. Finally, we will consider the challenge of engaging non-critical thinking societies.

> *Average intelligence may recognize the truth occasionally, and exceptional courage may now and then retrieve a blunder; but usually intellectual inadequacy will be shown up by indifferent achievement.*[7]

What is Critical Thinking?

There is only one thing harder than learning to think critically—trying to define the concept in a comprehensive way. To arrive at a comprehensive definition, one must consider the origins of critical thinking, some misconceptions about critical thinking, and some of the attributes of critical thinking.

We can trace the origins of critical thinking back to the early Greek philosophers. The word itself comes from two Greek words: *kriticos*, meaning discerning judgment and *kriterion*, meaning standard.[8] Among the philosophers most closely associated with critical thinking was Socrates, who strived to find meaning and truth through serious questioning. In his day, Socrates embodied the ideas of *kriticos* and *kriterion*, two ideas we will consider later when we address a modern construct for critical thinking. He developed the art of Socratic questioning to reach a more profound logic, understanding, and reflective thought.[9] In essence Socrates' method was the quest for reason and wisdom. Many years after Socrates, Clausewitz too tried to define critical thinking. As mentioned earlier, Clausewitz called his brand of critical thinking *"*Genius.*"* In his definition, Clausewitz stated, *"*Genius consists in a harmonious combination of elements, in which one or the other ability may predominate, but none may be in conflict with the rest.*"*[10] He further defines critical thinking as *"*strength of mind*"* and as *". . .* the ability to keep one's head at times of exceptional stress and violent emotion.*"*[11] While we have no evidence Clausewitz studied Socrates, there seems to be little doubt Clausewitz understood critical thinking and helped solidify the importance of critical thinking to strategic leaders.

Even with the clear writings of Socrates and Clausewitz, there are still misconceptions about what constitutes critical thinking. Many people often use the term 'critical thinking' without understanding the concept, the meaning, or how to apply it. Others progress to a stage sociologist Dr. Richard Paul, calls *activated ignorance* that is, taking into the mind and actively using information that is false though mistakenly thinking it is true.[12] Another misconception involves the term 'critical thinking' itself. Critical thinking is not being a critic or a cynic. Being a critic or cynic is not critical thinking at all, but many times this is the common practice. Some people even confuse critical thinking with having a critical spirit. This does not mean being negative or hypercritical of everything or every issue.[13]

Exploring the attributes of a critical thinker will help lead to a common definition. Critical thinking can be termed *robust thinking* because it involves many different attributes. Most importantly critical thinking is a *state of mind* whose goal is better thinking. The attribute is being repetitively cognizant of one's thought process. The term 'meta-cognition' has been used to describe this state of being—essentially 'thinking about thinking.'[14] The mark of a good critical thinker then is the ability to continually monitor thought patterns for emotional, analytic, and psychological biases. Another critical thinking attribute is a questioning or inquisitive attitude. Critical thinkers always ask questions to learn more and arrive at greater depth of understanding. Critical thinkers appreciate and are not threatened by contradictory information that does not match what is already understood and accepted. Additionally they are comfortable working with ideas and thinking of things in different ways. Finally critical thinkers like to hold their thinking to high standards of objectivity. Taken together, these attributes give critical thinking its robust qualities.

Although defining critical thinking is still difficult Dr. Richard Paul, the foremost scholar of critical thinking uses the following definition—

Critical thinking is

- ❑ Disciplined, self-directed thinking that exemplifies the perfections of thinking appropriate to a specific mode or domain of thinking.
- ❑ Thinking that displays mastery of intellectual skills and abilities.
- ❑ The art of thinking about one's thinking while thinking, to make one's thinking better: more clear, more accurate, or more defensible.
- ❑ Thinking that is fully aware of and continually guards against the natural human tendency to self-deceive and rationalize to selfishly get what it wants.[15]

A more concise definition of critical thinking is: *the ability to logically assess the quality of one's thinking and the thinking of others to consistently arrive at greater understanding and achieve wise judgments*. There are many other definitions of critical thinking and most are very similar. The key is to recognize that regardless of the

definition, critical thinking abilities can be individually developed.

Developing Critical Thinking

One of the most effective ways to develop this strategic leader skill is by studying the parts of critical thinking—specifically certain elements and standards. As one can imagine, there are a number of authors who write about critical thinking including Peter Facione and the late John Boyd. Each presents very compelling explanations and insights into critical thinking. However, Dr. Richard Paul developed a certain comprehensive model for learning critical thinking. The Paul model presents an integrative approach to critical thinking that allows for easier mastery of this essential strategic leader skill. In essence, the Paul model is easier to study, easier to practice and easier to teach. As a future critical thinker, you will have to commit to each of the above actions to reach the level of what Paul terms *"*Master Thinker.*"*[16] The Paul model can be presented as two complementary parts: elements of reasoning and intellectual standards (see Figure 1).[17] Before moving to a more detailed explanation of this model, a word of caution. Sometime models tend to discourage certain individuals from learning particular subjects. If this is the case for you, consider this model strictly as a way to learn a new style of thinking. It is not intended as a linear or sequential process. The model is simply a depiction of how critical thinkers relate thinking abilities to the real world and arrive at reasoned, wise judgments. Using both parts of the model, elements and standards, helps create the mind-matter relationship that is the basis of critical thought.

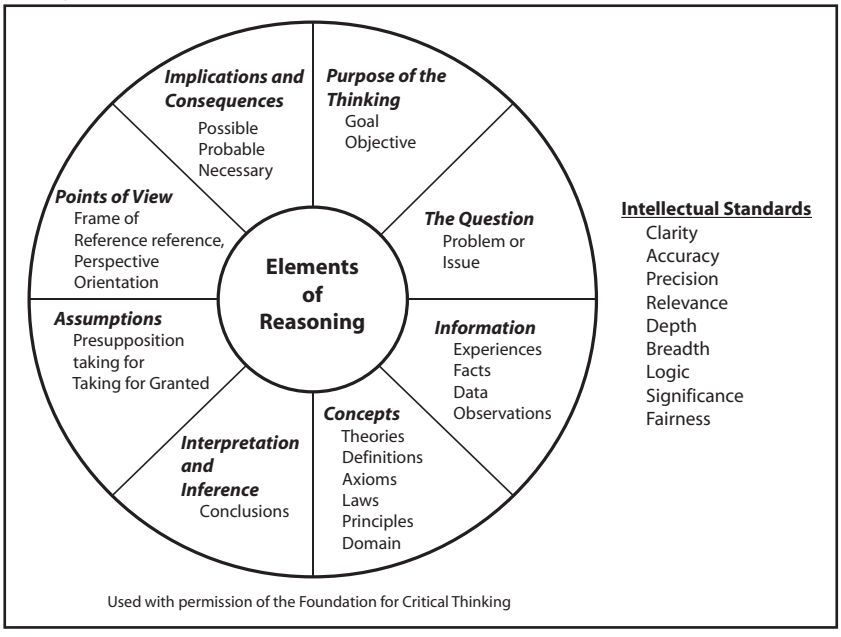

Figure 1. Elements of Reasoning

"Only those general principles and attitudes that result from clear and deep understanding can provide a comprehensive guide to action."[18]

The Elements of Reasoning

In the Paul model there are eight elements of reasoning: purpose, question, information, concept, inference, assumption, point of view, and implications. While we will cover each element in this same sequence, please note the elements are arranged in a circular pattern to emphasize their non-linear, complementary nature. We will return to this mutually supportive arrangement later in the discussion. What follows is an explanation of each element and the standards.

***Purpose*:** Critical thinkers want to assess the purpose of their thinking and their actions. For instance, a critical thinker might ask, is my purpose in line with my goals, values, desires, and needs? Many times the non-critical thinker will delude or deceive him or herself about the true purpose of a thought or action. For instance, one may say they want the tough job at the Pentagon because it is exciting and challenging. However, the true purpose may be accepting a position with greater long-term promotion potential. The critical thinker looks deeper for the essential motive or purpose in each situation attempting to eliminate false purposes.

Many examples of false purpose can be found in the media. For example, article titles often obscure the true purpose or intent of the text. Of course deliberate false purposes can also have an effect during war, especially when used as part of an information operations campaign. In the months heading up to Operation Iraqi Freedom, many of the stories concerning the U.S. Army's 4th Division had a much greater purpose than showing morale. As General Tommy Franks indicated, one entire front of the war was devoted to deception, in essence deliberate false purposes.[19] The key to understanding purpose is being aware of one's self-deception tendency and cognizant of planned deception operations.

***Question*:** Without a doubt, questioning is the most important element of critical thinking. One can look at critical questioning in three ways: the need to continually use critical questions, the interrelationships of critical questions, and the need to ask and answer critical questions at the right time.[20] The critical thinker must seek to identify the primary issue, problem, or question

at stake. In essence this is defining the problem. Although this sounds easy enough, things become difficult as scenarios change and events occur which change the central issue. The astute critical thinker will continually evaluate whether they are trying to answer the right question or solve the right problem. Paul categorizes questions into three types: questions of fact, questions of preference, and questions of judgment.[21]

For strategic leaders, questions of judgment become the difficult challenges requiring the best in critical thinking. Whereas questions of fact have one right answer and questions of preference have many answers, questions of judgment require reasoning skills. Using probing questions leads to the deeper understanding required by the complex national security environment. Some examples of questions of judgment with respect to our current conflict might include: What is the best way to fight terrorism? How can we protect American civil liberties and maintain security? Another timely question of judgment concerns Iraq—How can the U.S. convince Iraqi clerics to support our goals?

Information: In our society there is generally no shortage of information, and most often this becomes a problem. Former Harvard professor Francis Aguilar estimates that seventy percent of the information strategists use comes from outside their organization and fifty percent is from informal channels.[22] The critical thinker must determine what information is most important and judge the quality of information. One must consider the biases and filters between incoming information and mental comprehension. Additionally, a critical thinker must see how all the information fits together and what linkages exist between the information and the entire organization. This is a systems thinking approach.[23] Again Paul writes about three ways the mind takes in information: *inert information, activated ignorance,* and *activated knowledge*.[24] Inert information is useless—nothing more than clutter in the mind. Activated ignorance is dangerous—using false information as truth. Activated knowledge is powerful—truthful information that leads to greater understanding and wise decision-making. Critical thinkers are generally skeptical of information and as such rely very heavily on the intellectual standards to help evaluate data to create information that leads to knowledge.

We will discuss the relationship to standards later but one final point on information deserves attention—a dearth of information. Strategic leaders during wartime conditions often feel as though there is not enough actionable information and this can lead to strategic indecision. Author Gary Klein calls this paralysis *"doubt that threatens to block action."* He further states that decision makers often believe a decision can be improved by collecting more information. But, in many instances this delay results in lost opportunities.[25] Military strategist John Boyd considered *"rapidity"* one of his four parts of strategic thinking. Boyd believed effective organizations avoided getting bogged down in information. They make decisions with the information available at the time.[26] In cases like this, critical thinking is even more important to ensure reasoned, sound judgments.

Concepts: The most powerful element of critical thinking is concepts. A concept is an idea or object that makes some other idea or thing comprehensible.[27] It would be impossible to understand the world without using and understanding concepts. Consider this simple example: the concept of time makes the idea of a watch or calendar possible. We have all read about people who were great conceptual thinkers, people like George Kinnen and Albert Einstein. These men had the ability to think in different dimensions—using known ideas in a different way. One might say conceptual thinking is the seed of *"outside the box"* thinking. Boyd described this kind of thinking in his concept of *"variety."*[28] Conceptual thinkers are able to change focus and shift their thinking to see things differently. They remain open to new information and new ideas. These new ideas spring from using multiple concepts.

The problem with non-critical thinkers is that they are unable to change their concepts. Uncritical thinkers get stuck using the same concepts or use incorrect concepts to interpret the world. They enter a conceptual trap! If one is trapped in a single set of concepts, one can think of things in only one way. Many times the trap is constructed by a person's education, upbringing, and belief system. Of course the result at the strategic level can be strategic surprise or strategic disaster. The United States witnessed an example of this conceptual thinking on September 11, 2001. On that day the concept of 'a missile' or 'bomb' changed and so did our idea of how to protect against such a conceptual shift. Beforehand we were stuck in the conceptual trap that hijacked aircraft are used as hostages for ransom rather than weapons.

The attack also demonstrated the power of conceptual traps. CIA Director George Tenet said, none of the warnings indicated terrorists would fly aircraft into buildings—this concept was anathema to our thinking.[29] Even though intelligence activities over a several year period suggested terrorists were interested in pilot training, commercial

aircraft, and attacks, these small pieces of information individually could not change our conceptual thinking. Conceptual traps require overwhelming, explicit information to dismantle or strong critical thinking skills to overcome.

The master critical thinker forces the mind to think of different ways of employing or integrating the same things or ideas. Strong critical thinkers are strong conceptual thinkers who exhibit the mental agility required to rapidly and comfortably change domains of thinking to critically evaluate and analyze their world.

Inference: An inference is the conscious thought process that draws a conclusion based on the interpretation of assumptions. As the elements go, inferences can be good or bad, true or false, logical or illogical. The key to understanding inferences (conclusions) is evaluating the underlying assumptions and applying good judgment in arriving at the correct conclusion. In the aftermath of the terrorist attacks of 2004 in Spain, many leaders drew conclusions (inferences), which were false. In this case the incorrect inference was the separatist group ETA was responsible for the carnage. Hence we have the saying *"*jumping to conclusions*"* and critical thinkers resist this urge. First they carefully evaluate and interpret the available information then assess the validity of the underlying assumptions. This kind of deliberate analysis and evaluation leads to a more reasoned, informed, conclusion.

Assumption: Just as it would be impossible to understand the world without concepts, it would be paralyzing to live without assumptions. An assumption can be either an explicit conscious statement of belief or more likely a subconscious belief taken for granted. Authors Neil Brown and Stuart Keeley divide assumptions into two categories: value based and descriptive.[30] Value based assumptions are based on how one believes the world should be—the concept of 'ought.' Descriptive assumptions are more explicit and describe the world as it actually is. Many times this contrast in assumptions creates conflict for the critical thinker—a conflict that will be addressed more thoroughly later. We have all used conscious assumptions to help drive planning when there is a dearth of factual information. This is a perfectly logical and reasonable approach to thinking.

However, the assumptions we make with our subconscious mind are not always thought out or evaluated for validity. Using the Spanish example from before, the underlying assumption was all terrorism in Spain is cause by the ETA. One can easily see how faulty, subconscious assumptions lead to inaccurate conclusions. Another example of this was the 1995 bombing of the Murrah Federal Building in Oklahoma City. Again we see the same impact of faulty assumptions—that terrorism in America is caused by Arabs or Muslims. A similar faulty assumption initially occurred with several anthrax scares in the Washington, D.C. area in October 2001. Critical thinkers become keenly aware of their assumptions. Not that we question all the simple assumptions that help us make it through the day, but those assumptions tied to inferences (conclusions) with large implications need careful thought. The master critical thinker attempts to bring the subconscious thoughts and assumptions into a conscious level of understanding so these assumptions can be questioned, analyzed, evaluated, and either validated, rejected, or updated.

". . . fresh opinions never cease to batter at one's convictions."[31]

Point of View: Being able to see things from another point of view is an essential part of critical thinking closely related to conceptual thinking. The master critical thinker looks at situations from multiple points of view and different domains of thinking. For instance, critical thinkers may look at terrorism from a security domain, from a political domain, a legal domain, or a combination of the three. The ability to enter other points of view or consider a situation from another domain can be very insightful. Critical thinkers first recognize their own point of view then acknowledge other points of view and note the contrast. Strategist Boyd would consider this kind of thinking as *"variety"* and *"harmony"* in that effective organizations invite rather than fear different points of view.[32] Critical thinking organizations operate without letting their point of view distort or exclusively dominate the thought processes. Consultant Peter Linkow calls this kind of strategic thinking *"*valuating.*"*[33] Linkow suggests expert valuators conduct a stakeholder analysis to become sensitive to the interests of others. In essence, this approach requires the critical thinker to deliberately enter another point of view. It will not be easy to initially enter another point of view—it takes extreme mental flexibility and intellectual discipline to eliminate one's biases against doing so.

Critical thinkers do not see opposing points of view as a threat, but rather another belief to be understood and perhaps even adopted. It is worth mentioning that accepting different points of view does not necessarily lead to capricious decision making. On the contrary, Clausewitz argues just the opposite. He reminds us that new opinions will constantly batter one's convictions and charac-

ter.[34] But, the critical thinker will not become obstinate as a result. One becomes obstinate, Clausewitz reminds us, *"*. . . as soon as. . .[he] . . .resists another point of view not from superior insight or attachment to some higher principle, but because he objects instinctively.*"*[35] Exploring different points of view will help a critical thinker, especially in strategic leadership situations, understand the environment and clarify ambiguity.

Implications: Implications are what we expect to happen before a decision. Consequences are what actually happen after the decision.[36] Critical thinkers always consider the implications of their beliefs, opinions, and actions. In fact, according to Paul, master thinkers should think about implications in three ways: possible, probable, and inevitable. When thinking about implications, first consider all the reasonable possibilities. In essence this includes everything from the best case to the worse case. At this point, one has developed the total expected implication set. It follows that if this set is comprehensive, it will include the consequences of an action. Next the critical thinker should consider which implications are most probable in a scenario. Finally, identify any implications that are inevitable given the situation. This kind of futures analysis is more than simple guessing. It forces one's thinking to focus on ends. From here the critical thinker can easily compare *possible implications* and *probable implications* with *expectations* of what will solve the problem or address the issue at hand. The critical thinker's expectations become the fourth part of implications, what is a *"*required*"* implication given the current problem or scenario.

Relationship of the Elements

By now you may have the opinion the Paul model of critical thinking is a rather linear way of thinking. However, the elements are more complicated than a linear model. For instance, each element of reasoning is linked simultaneously with the other elements. Consider these examples. As new information becomes available to the decision maker, assumptions and inferences may change. Changes in information will generate new questions, impact point of view, or require new concepts. If we change our assumptions, inferences-conclusions will be affected. Questioning permeates the entire model in that one must use questions to illuminate each of the other elements. For instance, the critical thinker must ask: What is my real purpose? What is the key issue? What is the most relevant information? What are the correct concepts in this case? Are my assumptions valid? Have I drawn the correct inferences? What points of view matter? What are my desired implications?

While this kind of circular thinking is being conducted, one must ultimately come back to both purpose and implications. The interrelationships between the elements of critical thinking meld into a dynamic system of thought—not a sequential, linear checklist approach. This kind of thinking requires a certain flexibility of the mind and is what this author terms *"*robust thinking.*"* Just as in robust decision making, robust thinking constantly updates one's thought process by scanning for new information, checking for personal biases, maintaining conceptual flexibility, and sustaining open mindedness.

Intellectual Standards

The elements of reasoning form a framework for critical thinking. Intellectual standards act as a set of principles that help gauge or measure the quality of one's thinking. Paul lists nine intellectual standards critical thinkers use to help raise the quality of thought. These standards include: clarity, accuracy, precision, relevance, breadth, depth, logic, significance, and fairness.[37] Critical thinkers apply the standards to each of the elements of reasoning to create a more reasoned, valid pattern of thinking. As one might expect, some standards are more applicable to certain elements than others with one exception. Paul maintains that clarity is a gateway standard.[38] Each of the elements must be clearly understood for critical thinking to occur. Essentially this is the *"*meeting of the minds*"* before serious thinking begins. Clarity does not provide comprehension but it makes comprehension possible. The critical thinker must ensure each element is clearly understood before further thought can proceed with the expectation of reasonable progress or useable results. Once an element is clearly understood, one can apply the remaining standards to achieve a robust level of thinking.

The best way to apply these standards to a particular element is by asking a question related to the standard.[39] For instance, the critical thinker may ask of a particular element, Is this accurate? Truthful? How can one verify this? Using the precision standard helps critical thinkers refine information. One question could be, Is this precise enough for decision making? Could this information be more exact? Relevance helps distill the complexity of critical thinking by helping focus one's thinking on the parts of a scenario that relate to the question or decision at hand. As mentioned earlier, normally decision makers are overwhelmed by information, assumptions, points of view, and implications. Being able to ask *"*How is this relevant?*"* is a step toward simplifying decision making. The breadth and depth standard are the two most closely related. Taken together they are complementary—either something is

too narrow or too shallow. The key is to recognize a certain robust harmony between these two standards. For instance, critical thinkers are looking for breadth in point of view, concepts, and implications.

At the same time, one needs depth in information, concepts, assumptions, and questions. In essence these standards lead to the question, do I have a wide enough view (scan) with sufficient detail on the second and third order effects? When considering logic as a standard, the simple test is: Does this make sense? Another question may apply: Does this opinion track with the available proof? Here the inquisitive, skeptical mind is an asset to critical thought. Logic requires one to reflect and reconsider any conditional statement or information. The significance standard, like relevance, seeks to highlight not only what applies to the situation but also what is most important. Significance will help the critical thinker prioritize information, point of view, concepts, and implications. In a sense, significance could be thought of as the first step toward planning effects based operations.

Finally, critical thinkers need to consider the issue of fairness. This standard appears the most controversial of the group. Many of you are thinking, "Who determines what is fair", and "How does one determine what fair is?" Both good questions without a short answer when explaining the standard of fairness. In fact when asking a panel of experts studying critical thinking to evaluate the issue of critical thinking and ethics, the majority concluded that critical thinking is totally unrelated to political correctness, morality, or values.[40] In practice we see this when very skilled professionals use critical thinking to mislead or exploit others. The issue with this kind of *"weak"* critical thinking is how easily personal biases, and ego creep into the thought processes. Suffice it to say, fairness has as much to do with personal bias and personal motives as ethical decision making. The thought behind fairness as a standard relates to an individual's propensity for self-deception. So, when gauging the fairness of a decision, the critical thinker must ask, Do my selfish interests distort this thinking, or "Is my decision fair to all concerned?" The fairness standard seeks to prevent egocentric thinking. As one's ego enters the thought process, critical thinking becomes poisoned with ulterior motives resulting in sub-optimized decisions. The ego determines the purpose and the central question, selectively chooses information, using only familiar concepts and unquestioned assumptions, leading to misdirected conclusions while considering limited points of view resulting in unwarranted implications. If clarity is the gateway standard, fairness is the *"*gut check*"* standard for eliminating egocentric bias.

"Come let us reason together." (Isaiah 19:1)

Critical Thinking: You Versus the Situation

Now that we have covered the basics of critical thinking this section will concentrate on putting this knowledge into perspective by offering a way to use critical thinking. Imagine being able to use critical thinking skills in two dimensions: the inner and the outer. In keeping with our abbreviated definition of critical thinking, remember that critical thinking is useful for monitoring the quality of your thinking, the inner dimension, and the quality of other's thinking, the outer dimension. Using the following compendium of questions, one can learn how to use both dimensions.

When considering critical thinking to guide the inner dimension of your own thinking ask yourself some of the following questions:

- What have I said is the purpose of my thinking?
- What questions do I have about this situation?
- What do I believe to be the key question or issue needing my decision?
- What information do I know to be true?
- What kinds of information do I have too much of? Too little of?
- What concepts am I using right now?
- What conclusions have I already drawn?
- What assumptions underlie these conclusions? Do I need to make any assumptions in this situation?
- What is my point of view? What other points of view are represented?
- What implications would I expect to see as a result of my critical thinking?
- What is my desired end state?
- Does all this seem fair and selfless?
- Have I checked my reasoning against some intellectual standard?

Now consider the critical thinking required to guide the outer dimension of your thinking. Seek answers to the following questions:

- What is my true purpose in this situation?
- Why am I really thinking about this?
- What questions should I be asking?

What questions are required that I have not asked?

What questions are forbidden to ask?

What information do I really need to know? What information is missing that I would like to know?

What other concepts could apply to this situation? What concepts should I be using that would change my thinking?

What other conclusions could be drawn from the information available?

Are others assumptions available for consideration? What assumptions would radically change my conclusions?

Whose point of view is missing from the scenario? From what point of view am I approaching this situation? Are there other domains or points of view that I could or should accept?

What are the possible implications from this robust thinking? Which implications are most probable? What implications are inevitable based on this thinking? How do these implications meet or exceed my desired end state?

How would I gauge the thinking of others in this thought partnership?

Have I applied the standards of thought to this reasoning?

One can see through this short exercise in questioning how learning critical thinking skills is possible. The key as with any new skill begins with study. This article should be the first issue in your study of critical thinking. There are many more available as mentioned in the notes. Future critical thinkers must also practice the new skill so critical thinking becomes second nature as your default thinking pattern. The more you practice thinking using the elements and standards, the quicker your thinking will improve. Initially this practice will be difficult especially as one challenges the mind to think in new ways, remain flexible, open to change, and confront one's ego. Over time, critical thinking will so dominate the thought process that you will begin to recognize uncritical thinking in others. At this point, the practicing critical thinker must attempt to challenge the thinking of others by explaining the concepts of critical thinking in a practical way. Being able to coherently explain, illustrate, or elaborate why certain reasoning is faulty is synonymous with teaching critical thinking. The master critical thinker teaches by demonstrating critical thinking in action.

Engaging Non-Critical Thinkers

Even though much has been written about critical thinking, many questions require further study, especially on how to engage non-critical thinking societies. Specifically, this challenge includes relating to non-critical thinking societies, reasoning with non-critical thinking societies, and changing non-critical thinking societies.

To understand non-critical thinking societies, one must appreciate the value of a liberal education. Here the term does not have a negative connotation but rather means being liberated from the control of other's thinking. In his book *Critical Thinking*, Richard Paul captures the essence of this phrase by including small outtakes entitled *"*Think for Yourself.*"* What an appropriate way to describe a liberal education. In those societies controlled by warlords, despots, and dictators, a liberal education is not universally allowed or even available to the general population. As a result, the population easily becomes harnessed to weak thinking, unquestioning obedience, and radicalism. This kind of thinking manifests itself through suicide bombers, fidayeen attacks, child soldiers, and fanatical clerics.

Another challenge of relating to non-critical thinking societies is, without the ability to think for themselves, these *"*think-less*"* societies become desensitized to basic human decency. Peter Facione in his article *"*Critical Thinking,*"* describes the process as refining humane sensibilities that lead to a critical appraisal of what is good and bad in human nature.[41] The lack of humane sensibilities leads to acts of barbarism like those in Rwanda and recently the gruesome killing of contractors in Iraq.[42] Additionally, non-critical thinking societies reject different points of view to the extent they become as Clausewitz mentioned, obstinate. Examples of this include the Islamic idea of apostasy where one who has known the faith and subsequently rejects it is marked for death.[43] Another issue, as Facione points out, is how easily non-critical thinking societies are exploited both politically and economically.[44] The impact of not understanding the international economic system, legal system, or social system is that these societies lag further behind the rest of the world, live meager lives without hope leading to even less critical thinking. Bernard Lewis, author of *The Crisis of Islam*, relates this downward spiral to the concept of frustration felt by many revolutionary Islamists.[45] Facione believes that in time the judicial and economic systems of such a society will collapse.[46]

As you can see, there are many challenges in trying to relate to non-critical thinking societies. But, since interaction between different societies is inevitable, how does a critical thinking society reason with a non-critical thinking society?

The question of reasoning with non-critical thinking societies boils down to two issues: what the society respects and patience in reasoning. Both these issues bear on the idea of establishing democracy in non-critical thinking societies. In many non-critical thinking societies, the only thing they respect is power—not culture. Non-critical thinking societies understand violence, not reason. Again we can turn to Clausewitz to shed light on this point when he posited, *"*in any primitive warlike race, the warrior spirit is far more common than among civilized people.*"*[47] Perhaps the non-critical thinking societies produce more violence prone cultures but according to Clausewitz, they rarely if ever produce a great commander or military genius because this requires the ability to think critically. At best critical thinking will have limited short-term success dealing with non-critical thinking societies. Without changes, ultimately reasoning with these societies will fail. As Bernard Lewis points out, some of these societies will seek short-term accommodation before turning to violent approaches.[48]

Author Roger Scruton writes in his book *The West and the Rest* that the view from many of these societies questions the entire western tradition of reasoning. They equate reasoning as a means to reinforce western values and as a result to accept one is to accept the other.[49] One might ask, without the ability to reason with non-critical thinking societies is it possible to create democracy? Facione posits "*. . .* in such a society, one that does not liberate its citizens by teaching them to think critically for themselves, it would be madness to advocate democratic forms of government."[50] Democracy is hard even under the best of circumstances and while there may be set backs, one can begin the process in non-critical thinking societies, but this kind of embryonic democracy will require extreme protection, advice, and perhaps a rescue mission or two. Since the quality of any democracy is equal to the quality of the democrats, in a non-critical thinking society, the quality of the democracy may be low for quite a while but a change to *"*thinking freedom*"* is essential to nurturing the beginnings of critical thinking.

How can a critical thinking society help bring about the changes required in non-critical thinking societies? As discussed earlier, critical thinking can be taught with varying degrees of success within any society. So, one approach should infiltrate the education systems of the subject society. This could be accomplished by direct intervention, with critical thinking teachers, or training for current teachers. Another effective idea is to immediately increase access to books and materials on critical thinking and reasoning skills. In many cases these kinds of works would be the first such editions translated into some languages. Next, telecommunications can be a tremendous "brain multiplier" if used to provide truthful, unbiased information to the targeted society. What would happen if a certain young democratic nation suddenly inherited one million satellite dishes each with pre-programmed information channels? Certainly the conceptual thinking required here is not to think about non-critical thinking societies as rejecting western reasoning but rather think of them as an educational challenge. Although the deep creativity necessary to solve this monumental problem is the subject for a subsequent article, the above ideas are readily apparent.

Epilogue

This article intended to explain the concept of critical thinking by first trying to define it and then reviewing what is considered one of the better models of critical thinking. One may argue whether one model is better than the next, but in this case, the elements of reasoning and intellectual standards presented represent the essence of how to think critically. Taken in their entirety, a short collection of questions can lead one to the kind of robust thinking required in today's strategic environment. Critical thinkers today face the challenge of creating the critical thinkers of tomorrow—many in foreign lands who have never known or accepted the power of critical thinking. Robust thinkers must answer the question, how do we accelerate the process of change in a society of critical thinkers over nihilistic decision making? We are living in the era of 'wars of the haves versus the have-nots' and now more than ever critical thinking seems to be a big part of what is missing from the societies we are trying to democratize. Becoming a critical thinker is an admirable goal requiring a committed effort to learn the concepts, practice the elements, and teach the ways. It is critical for military professionals to develop this essential strategic leader skill. Clausewitz recognized the value of critical thinking for strategic leaders when he wrote, *". . .* the human mind is far from uniform. If we then ask what sort of mind is likeliest to display the qualities of military genius, experience and observation will tell us that it is the inquiring rather than the creative mind, the comprehensive rather than the specialized approach, the calm rather than the excitable head to which in war we would choose

to entrust the fate of our brothers and children, and the safety and honor of our country."[51]

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Critical Thinking and Intelligence Analysis

by Michael A. Brake

Critical thinking is an essential tool in the analytical thought process. In his article *Critical Thinking For the Military Professional,* Colonel W. Michael Guillot, USAF, focuses on the importance of critical thinking as a required skill for strategic leaders. In our ongoing military operations around the world, this tool is applicable across the spectrum from strategic down to tactical level intelligence analysis.

Critical thinking allows us to constantly question the facts and assumptions we use as well as the intended purpose of our analysis so that we can adapt our analysis to the dynamic environments in which we are operating. It greatly aids us in 'thinking outside the box,' as the currently popular phrase goes.

As an example, in our ongoing operations in Iraq and Afghanistan, we are searching for individuals designated as high value targets. I will refer to them as high value individuals (HVIs). The basic overall intelligence analysis process for finding HVIs varies little from strategic down to tactical level, but the actual means of locating HVIs is never exactly the same because they are unique individuals. The first thing the Intelligence Analyst needs is command guidance on the purpose of locating the individual. Does the command want to capture the HVI, talk to the HVI or, perhaps, attempt to influence the HVI through political, social, or economic means? The commander's intent in locating the HVI will focus the intelligence analysis.

Next comes the hard part for Intelligence Analysts who are asked to locate an HVI. If we could gather all of the intelligence we ever wanted about an HVI, finding them would be no problem. In reality, of course, we are normally only able to collect small bits and pieces of useful information about our HVIs. This is where real intelligence analysis and critical thinking can pay off. The analyst who successfully led us to our HVI, Abu X, will not be as successful in leading to another HVI, Abu Y, by simply using the same facts and assumptions he or she previously used. Perhaps Abu X was a member of a specific group that we had determined meets every Friday at a specific market. We successfully captured Abu X by identifying him at the market and following him home before capturing him. Theoretically, if Abu Y is also a member of that same group, we should be able to capture Abu Y using the same method as we used with Abu X. But what if Abu Y turns out to be the only member of the group that doesn't go to that market every Friday because he has stronger ties to another market? Or that the group suddenly stops using that market for meetings because in a totally unrelated action, the manager of the market was just arrested by local authorities and the group no longer feels the market is safe? We could waste a lot of valuable and limited resources waiting to implement a 'foolproof template' for an HVI capture.

The analyst must constantly work to develop a comprehensive understanding of each HVI (background, culture, the physical and political environment, etc.) in order to 'get into the mind' of the HVI while avoiding jumping to conclusions based on the analyst's own personal background, preferences, etc. This is very similar to the work that criminal profilers do for law enforcement agencies, but with one big exception. Criminal profilers normally grow up in an environment and culture similar to (if not exactly like) that of the person that they are profiling. For the Military Intelligence (MI) analyst, that is rarely the case. Thus, the MI analyst must first set aside his or her own embedded cultural/environmental/ societal/political upbringing in order to comprehend the values and beliefs of the HVI, at least to the point of being able to put the limited available intelligence into context and understand when a critical nugget of information is collected (or how to collect that information) and to recognize how that information can be utilized to locate the HVI.

This is normally a long, involved, and often tedious process during which it is easy for critical thinking novices to fall back into their old, comfortable, non-critical thinking patterns. A constant reevaluation by other critical thinkers (not necessarily analysts) can be invaluable.

(Continued on page 51)

Training the Corps

New Capabilities and Training for CGS Operators/Analysts MOS (96H)

by Lieutenant Colonel Patrick L. Daniel

by Lieutenant Colonel Patrick L. Daniel

Two major capabilities upgrades are coming for the Common Ground Station (CGS). In the second half of fiscal year (FY) 2006, the Joint Moving Target Indicator Team (Army, Air Force and Marine Corps) secured funding for a Quick Reaction Capability (QRC) to field the moving target indicator (MTI) Forensics Tool Set to CGS Teams in Operation Iraqi Freedom (OIF). The MTI Forensics Tool Set was a proven MTI forensics analysis capability that had been used in sanctuary locations to support OIF operations for several years. Now we have this capability fielded to the brigade combat team (BCT), division, and corps level in Iraq with the software running on high-end desktop and laptop personal computers (PCs) with over-sized high resolution flat screen monitors. With the release of CGS Common Software Baseline (CSB) 5.0 in FY 2007, the MTI Forensics Tool will be integrated with the CGS.

MTI Forensics Tool Set Image

The second major capabilities upgrade coming to the CGS community is the Group 6 Modification Work Order (MWO) upgrade. The Group 6 MWO is a hardware and software upgrade for the current CGS V2. The MWO strips out all the old hardware components from the CGS V2 shelter and replaces them with new commercial off-the-shelf (COTS) components. The comprehensive upgrade covers servers, workstations, monitors, video and audio components, radios and communications suites, network interfaces, power and environmental controls. The Group 6 prototype was built in early FY 2006 and the system is currently going through testing and certification. The Marine Corps will upgrade three of its CGS systems with priority fielding to OIF unit(s). The Army plan is to upgrade 10 systems that will all be designated for OIF deployment, 2007 through 2009.

These significant upgrades come with new equipment training (NET). The MTI Forensics Tool was fielded to OIF units and the CONUS training base in 4th quarter, FY 2006. The U. S. Army Intelligence Center (USAIC) provided training for OIF CGS teams in country as the MTI Forensics Tool Sets were fielded in August and September 2006. In addition, MTI Forensics Tool Set training is now included in MOS 96H (Common Ground Station Operator) Advanced Individual Training (AIT) and the pre-deployment live environment training (LET) at the Joint STARS (JSTARS) Test Force in Melbourne, Florida. The Group 6 MWO will also come with NET. The primary strategy is to field the systems to units preparing to deploy for OIF 2007 to 2009 and provide the NET at home station prior to deployment. The secondary strategy is to field the system to a unit already deployed to OIF and provide the NET in-country. Additionally, the JSTARS Army Doctrine Training and Test Detachment (DTTD) will begin training the Group 6 system as part of the LET in January 2007 and will continue providing Group 6 training to participating units.

In addition to providing NET in the field, the DTTD also provides a five day LET opportunity at the Joint STARS Test Force facility in Melbourne, Florida. The LET focuses on CGS and Joint Service Workstation (JSWS) configuration, operation, maintenance, and repair. System configuration topics cover the most current software in-

stalls and Service Pack loading. Operations training consist of a combination of live and simulated data links to JSTARS (Surveillance and Control Datalink (SCDL) and satellite communications (SATCOM)), Integrated Broadcast Service (IBS) nodes of TRAP Data Dissemination System (TDDS), Tactical Information Broadcast System (TIBS) and Tactical Reconnaissance Intelligence Exchange System (TRIXS) using the Joint Tactical Terminal (JTT) radio. Classified LAN connectivity and data distribution via Multi-CGS and Enhanced Multi CGS modes are reinforced through operations and training.

Joint Service Workstation (JSWS)

These are exciting times for CGS operators/analysts as they receive new capabilities to leverage MTI with other sources to provide the warfighter relevant, timely, and accurate intelligence. The breakneck pace of deployments coupled with receiving and integrating new capabilities can challenge leaders as they strive to provide relevant training opportunities for their 96H soldiers. Network training opportunities and LETs can solve these challenges and provide commanders with trained CGS teams on the cutting edge. For more information on the LET, contact your local Project Foundry Manager and ask about LET Number 22. For more information concerning network training opportunities, contact SSG Alexis Lagundi at alexis.lagundi@jtf.hanscom.af.mil, (321) 726-7199 or SFC Rob West at robert.west@jtf.hanscom.af.mil, (321) 726-7219.

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Doctrine Corner

FM 2-22.3—New Doctrine for the New HUMINT Collector

by Stephen C. Clarke

Updated Doctrine

The U.S. Army has been publishing interrogation doctrine for over 60 years. In the course of that time, the duties of interrogators and the techniques they use have remained basically the same—the interrogator asks questions, the detainee answers...or doesn't. In the latter case, the interrogator has tools at his disposal to encourage cooperation. These tools are referred to as approach strategies; stratagems designed to legally and ethically gain the source's cooperation through emotional appeals, trickery, or use of various incentives. Army Field Manuals from **FM 30-15 (1945), Examination of Personnel and Documents** to **FM 34-52 (1992), Interrogation**, have provided guidance to interrogation practitioners on the best ways to use these tools to carry out their craft.

Over the past several years, however, the Army has expanded its concept of human intelligence (HUMINT) collection past interrogation, and changed the way it carries out the HUMINT collection mission. The institution of the Observations, Insights, and Lessons (OIL) process has provided a flow of feedback from the field that has led to, among other things, a reassessment of the capabilities that HUMINT collectors need to have in order to accomplish their mission. As a result of this reassessment, the Army has expanded the duties of the interrogator and renamed Military Occupational Specialty (MOS) 97E Interrogator to Human Intelligence Collector. The U.S. Army Intelligence Center (USAIC) was quick to incorporate lessons learned into MOS instruction. The recently published and implemented **FM 2-22.3, Human Intelligence Collector Operations**, codifies these same lessons learned into doctrine and provides expanded guidance to cover the HUMINT collector's new responsibilities.

The introduction of the military source operations (MSO) concept integrates all of the HUMINT collector's responsibilities under the construct of MSO. In addition to conducting screening and interrogations, the functions of Soldiers in MOS 97E now also include human source contact operations and debriefing. The doctrine for these new functions is presented in FM 2-22.3 as part of the recently implemented MSO concept, established by DOD in 2005. New material has also been added in response to lessons learned from Operations Iraqi Freedom and Enduring Freedom (OIF/OEF). Advances in the automation used by HUMINT collectors have also necessitated revisions in HUMINT doctrine. The introduction of new systems and capabilities, databases, and automated processes made those portions of FM 34-52 obsolete.

Effect of Current Events

Two recent events have affected the HUMINT field, and consequently, the contents of FM 2-22.3. Those events were the passage of the Detainee Treatment Act of 2005 into Public Law 195-140 (informally known as the McCain Amendment), and the DOD directed introduction of the MSO concept. Refer to MG Fast's column "Always Out Front" in this issue.

New Topics

A number of additional new topics have been added to FM 2-22.3. Two chapters in the main body of the FM address the topics of HUMINT analysis and automation. New appendices present material on—

- ***Source Reliability***. The source reliability matrix has been reintroduced in response to requests from the field. This matrix provides an easily understood method for categorizing sources and their information.
- ***Pre-Deployment Planning***. This guide offers suggestions to commanders for actions that should be taken prior to deployment in order to be able to best support their HUMINT collectors in the field. The appendix also provides sources for additional information.

- ***Questioning Guide***. The questioning guide closely follows the training materials used at USAIC to teach questioning. The topics and questions are adaptable for any type of conflict.
- ***Contract Interrogators***. The use of contract interrogators raises unique issues concerning their qualifications, employment and mission restrictions, and other legal and policy issues. This appendix provides the commander with basic information on properly utilizing these valuable assets.
- ***Equipment for HCT Operations (HCT Kitbag)***. USAIC, in conjunction with the TRADOC Capability Manager–Ground Sensors, prepared an equipment list as a guideline for commanders to use to equip their HCTs. Much of the recommended equipment on the list was actually purchased and 175 kitbags were fielded to OIF as stay behind equipment for follow-on HCTs.

Table 1. New or Expanded Topics in FM 2-22.3

S2 Instructions for Handling Prisoners
MP Responsibilities for Detainees
Legal Issues (GPW, GC, ROE)- Expanded and threaded throughout the manual.
Staff Responsibilities
Rules of Engagement
Rights of EPWs and other categories of Detainee
HUMINT as Part of MSO
Working with contractors
Added Strategic Debriefing and Source Operations
DOCEX Appendix Added
Working With OGAs
HUMINT /MP Coordination for Responsibilities
Prohibitions Against Torture and extracts from the GPW and Title 18, USC
Reporting War Crimes
Categories of Detainees
Expanded References for Legal Issues and Contractors
Army and Joint Command Relationships
Expanded Material on Automation
Expanded Questioning Methods
New Material On Analysis

Applicability

This manual is intended for use by military, civilian, and civilian contractor HUMINT collectors, as well as commanders, staff officers, and Military Intelligence (MI) personnel charged with the responsibility of the HUMINT collection effort. It is also to be used by military commanders and their staffs responsible for the planning, oversight, and conduct of interrogations of detainees "in the custody or under the effective control of Department of Defense or under detention in a Department of Defense facility." (Detainee Treatment Act of 2005) The FM also applies to other governmental agencies and foreign governments conducting approved interrogations in a DOD facility.

Although decades have passed since the U.S. Army began documenting HUMINT collection doctrine, the goal of the HUMINT collector has remained basically unchanged—to support the commander by collecting and reporting human intelligence effectively, while treating detainees humanely. Throughout this timeframe, many lessons have been learned, technology has advanced, and new concepts have emerged. FM 2-22.3 is an important step forward in the continuing effort to provide the Soldier with the best and latest tools to accomplish the HUMINT collection mission.

Where to Find It

FM 2-22.3 is available at http://www.army.mil/references/FM2-22.3.pdf. This FM is approved for public release; distribution is unlimited.

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Intelligence Philatelic Vignettes

Bletchley Park Mail

By Mark Sommer

A picture postcard of the Ely Cathedral with a circular date stamp "Cambridge" of September 7, 1943. This is a very scarce item, possibly written from someone at Cambridge University. Much of the correspondence sent to and from Bletchley Park was destroyed after World War II ended. Part of the correspondence states, ". . . Am very busy with project which is becoming quite exciting . . ." Possibly the Enigma Code?

Front of Postcard.

Back of Postcard.

Mark Sommer holds a BA in Political Science from Yeshiva University and an MA in International Relations from Fairleigh Dickinson University. He teaches at Stevens Institute of Technology in the Humanities Department. His published works in the intelligence field include: "Getting the Message Through: Clandestine Mail and Postage Stamps", ***MIPB****, October–December, 1992 and "Undercover Addresses of World War II",* ***International Journal of Intelligence and Counterintelligence****, Fall 1993.*

(Continued from page 47) ***Critical Thinking and Intelligence Analysis***

During a recent tour to Iraq, a junior analyst who was new to the Theater came to me with a conclusion about the impending location of an HVI. The analyst was convinced in his own mind that his analysis was spot-on. I asked why the HVI would be at the assessed location. The analyst's answer boiled down to "because that's what I would do." This led to a long, useful discussion about the HVI's cultural background, values and beliefs and the analyst reassessing his previous 'firm' conclusion. Ultimately, that analyst continued to develop critical thinking skills and applying them to future analysis, becoming the foremost expert on that HVI in theater.

So, without getting too deep into specific examples or detailing the critical thinking process–which Colonel Guillot's article does quite nicely–you can begin to see that the critical thinking process applies as equally to the tactical and operational levels as it does to the strategic level. For MI professionals, using critical thinking as a tool won't ensure that our intelligence analysis is one hundred percent correct, but it will assist us in making the best analysis that we can with the information that we have at hand.

Michael Brake is a writer at the U.S. Army Intelligence Center and Fort Huachuca Doctrine Division. He recently returned from a deployment to Iraq where he served as the Targeting Officer in the Joint Interagency Task Force–High Value Individuals. He is currently writing **FM 2-33.5, Intelligence Reach***. Readers may contact him via email at Michael.brake@us.army.mil or by telephone at (520) 533-9972 or DSN 821-9972.*

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Articles about current operations and exercises; tactics, techniques, and procedures; and equipment and training are always welcome as are lessons learned; historical perspectives; problems and solutions; and short "quick tips" on better employment or equipment and personnel. Our goals are to spark discussion and add to the professional knowledge of the MI Corps and the IC at large. Propose changes, describe a new theory, or dispute an existing one. Explain how your unit has broken new ground, give helpful advice on a specific topic, or discuss how new technology will change the way we operate.

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- ❑ Feature articles, in most cases, should be under 3,000 words, double-spaced with normal margins without embedded graphics. Maximum length is 5,000 words.
- ❑ Be concise and maintain the active voice as much as possible.
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- ❑ A cover letter (either hard copy or electronic) with your work or home email addresses, telephone number, and a comment stating your desire to have your article published.
- ❑ Your article in MS Word. Do not use special document templates.
- ❑ A Public Affairs release if your installation or unit/agency requires it. Please include that release with your submission.
- ❑ Any pictures, graphics, crests, or logos which are relevant to your topic. We need complete captions (the who, what, where, when, why, and how), photographer credits, and the author's name on photos. Please do not embed graphics or photos within the article's text, attach them as separate files such as .tif or .jpg. Please note where they should appear in the article.
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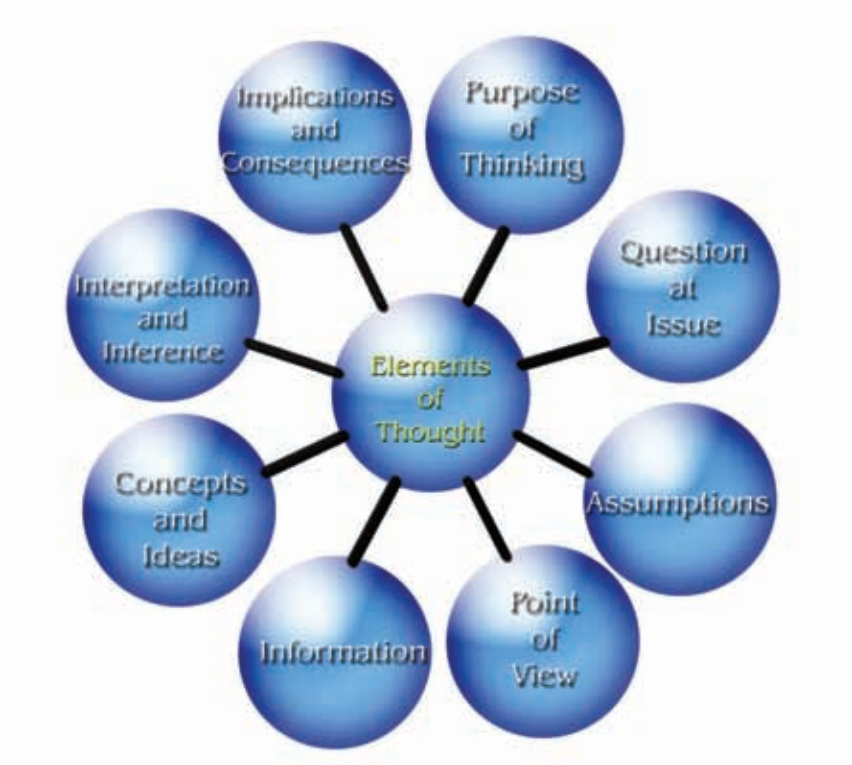
Upcoming Themes and Deadlines

Issue	Theme	Deadline
Oct-Dec 06	National Agency Support to Intelligence Operations	10 Nov 06
Jan-Mar 07	COIN	31 Jan 06
Apr-Jun 07	Modularity	30 Apr 07
Jul-Sep 07	GEOINT	31 Jul 07
Oct-Dec 07	Biometrics	30 Oct 07



A Checklist for Critical Thinking

From FM 2-33.4, Intelligence Analysis, June 2006 (Draft)

1. All reasoning has a **Purpose**.
   - ❑ Express your purpose clearly.
   - ❑ Distinguish your purpose from similar purposes.
   - ❑ Check regularly to ensure you are still on target.
   - ❑ Choose meaningful and realistic purposes.

2. All reasoning is an attempt to find an answer, to resolve some **Question**, and solve some **Problem**.
   - ❑ State the question at issue clearly and precisely.
   - ❑ Express the question in several ways to clarify its meaning and scope.
   - ❑ Break the question down into sub-questions.
   - ❑ Determine if the question has only one correct answer, decide if it's fact or opinion, assess whether it requires reasoning from more than one point of view.

3. All reasoning is based on **Assumptions**.
   - ❑ Identify your assumptions and determine whether they are justifiable.
   - ❑ Consider how your assumptions are forming your point of view.

4. All reasoning is done from some **Point of View**.
   - ❑ Identify your point of view.
   - ❑ Gather other points of view and identify their strengths and weaknesses.
   - ❑ Strive to be open-minded in evaluating all points of view.

5. All reasoning is based on raw **Data** and **Information**.
   - ❑ Restrict your claims to those supported by the data you have.
   - ❑ Search for information that opposes your position as well as information that supports it.
   - ❑ Make sure that all information used is clear, accurate, and relevant to the question at issue.
   - ❑ Make sure you have gathered sufficient information.

6. All reasoning is formed by, **Concepts** and **Ideas**.
   - ❑ Identify key concepts and explain them logically.
   - ❑ Consider alternative concepts or alternative definitions to concepts.
   - ❑ Develop ideas clearly and precisely.

7. All reasoning contains **Inferences** or **Interpretations** by which we draw **Conclusions** and give meaning to data.
   - ❑ Infer only what the information implies.
   - ❑ Confirm assumptions which lead you to your inferences.
   - ❑ Verify inferences for their consistency with each other.

8. All reasoning leads somewhere or has **Implications** and **Consequences**.
   - ❑ Trace the implications and consequences that follow from your reasoning.
   - ❑ Search for negative and positive implications.
   - ❑ Consider all possible consequences.

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