

Critical Thinking Training for Army Schoolhouse and Distance Learning

High Pay-off Skills to deal with the uncertain

The ability to critically think through a problem, rather than only apply previously learned solutions, is crucial to Army success.

Army officers are often required to operate in situations which they may not have previously encountered and for which they haven't been trained—for example, fighting terrorism, performing peace keeping operations, disarming an explosive device they have never seen before, or working closely with team members of other nationalities who have different ways of approaching problems. The ability to critically think through a problem, rather than only apply previously learned solutions and procedures, is crucial to Army success. The U.S. Army Research Institute is sponsoring research to investigate ways of training high quality critical thinking skills to better equip Army officers to deal with the novel, uncertain, and complex requirements of future Army operations.

Identifying High Payoff Critical Thinking Skills

Educators have long been interested in training critical thinking skills (CTS). The particular set of required CTS appears to vary depending on the domain in which they are to be used. Thus, the first step in developing training for Army Battle Command critical thinking skills was to decide which CTS should be trained. To identify these CTS, we first developed a model of critical thinking (see Figure 1) based on an extensive review of the psychological, educational, philosophical, military and commercial literatures dealing with critical thinking. The model was developed and validated for conceptualizing critical thinking within a Battle Command context. The literature review also identified over 100 core critical thinking skills described by theorists and researchers. We then conducted a survey of Army officers to assess their experiences related to CTS, their predispositions for critical thinking, their opinions about situations within

the Battle Command domain requiring CT, and difficulties related to CT. From the original set of CTS appearing in the literature, we identified key CT skills using two criteria: (1) how important each was to the success of battle command operations and (2) how difficult or problematic each skill was to execute. Based on this analysis and a subsequent validation, we identified eight high pay off CTS. These are listed in Table 1.

Table 1. High Pay-off Critical Thinking Skills for Army Battle Command

- Frame the Problem
- Recognize main point in a message
- Visualize plans to see if they achieve goals
- Construct a plausible story that ties all incidents together
- Recognize fallibility and bias in own opinion
- Generalize from specific instances to broader classes
- Adopt multiple perspectives in interpreting events
- Determine when to seek more information

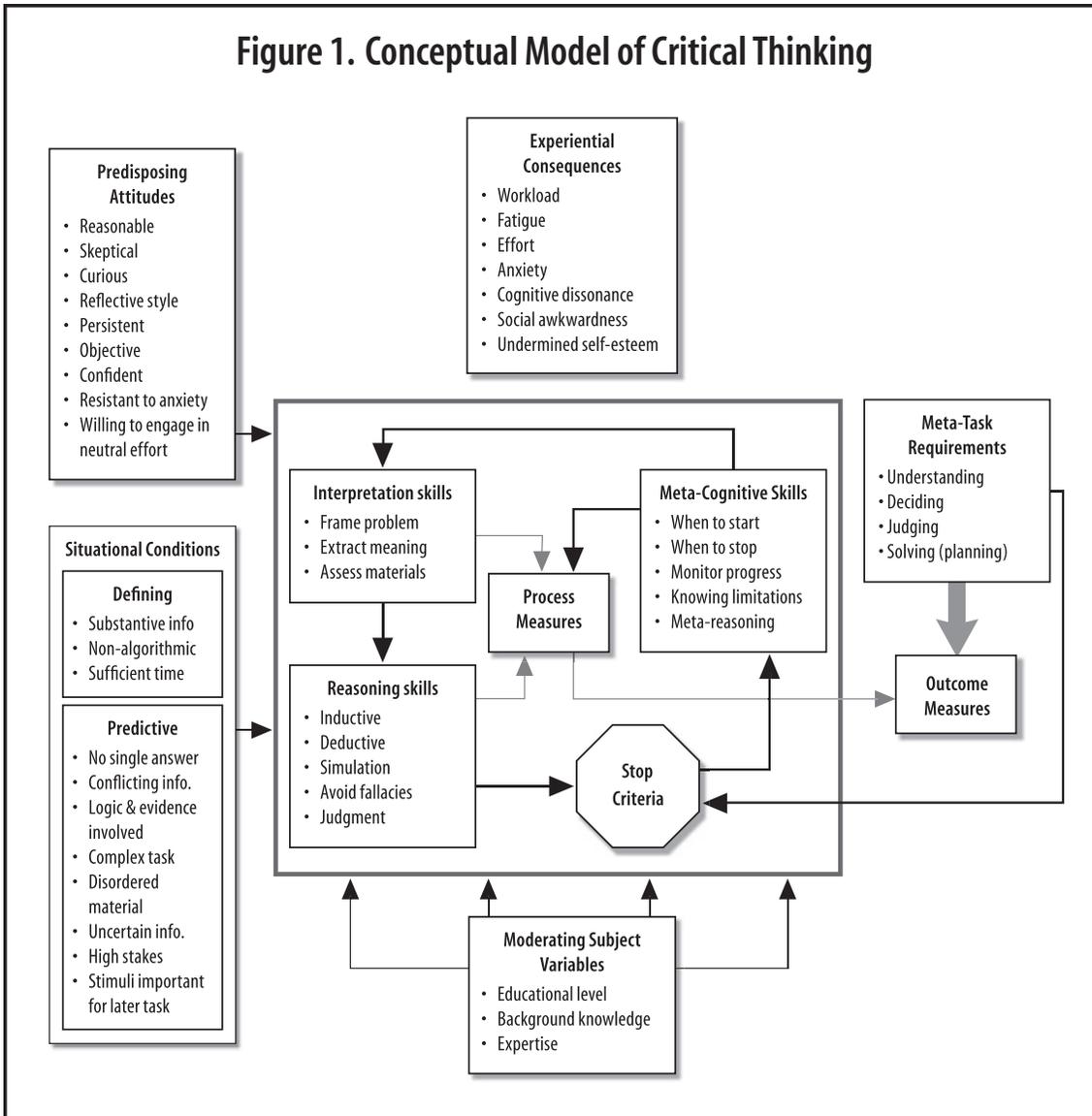
Training Approach

CTS are a set of cognitive skills that are developed over time given the appropriate educational experiences and practice. The quality of performance of CTS may reflect some raw ability, but our training approach is based on the theory that everyone can develop critical thinking skills given appropriate educational experiences and practice. As with any skill-acquisition training, students must be given an explanation of the skill and how it is used, an opportunity to practice the skill, and immediate feedback about their performance of the skill.

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Figure 1. Conceptual Model of Critical Thinking



Our approach to schoolhouse implementation of CTS training seeks to integrate the skills into lesson plans in such a way that they are practiced and evaluated in the course of a seminar discussion or a practical exercise. These skills are explicitly listed in the lesson plans, but ideally they are integrated seamlessly into the conduct of regular classroom instruction. A history lesson may compel students to adopt multiple perspectives. A tactical planning exercise may compel

students to visualize plans to see if they accomplish an objective. A leadership lesson may compel students to challenge their own biases. If a student identifies the skill and wants to discuss it, that is encouraged. However, the skill will not normally be explicitly acknowledged by the instructor in the course of the instruction. The instructor also provides a model of how to execute critical thinking in his own approach to the exercises.

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The emphasis is on student demonstration and instructor evaluation of the student CTS.

Our web-based training system approach (1) incorporates an explanation of CT, an explanation of the CT skill being trained, the rationale behind the skills and how it is used in the battle command environment, (2) provides exercises in which students practice elements of those skills, and (3) provides appropriate and immediate feedback on their performance.

Eight High Payoff CTS and CT Specific Training Concepts
Eight key skills were identified and validated in our interviews with Army officers.

Seek a clear statement of the problem. Sub-skills include: identifying and resolving weak spots in a message, chunking and integrating critical information, and assessing the overall representation of the problem. One key training concept for this skill is “Fuzzy Statement Training”. This involves helping students to quickly and reliably distinguish clear statements from fuzzy counterparts. Our focus is to teach students to recognize ambiguous spots in material and to produce clear statements.

Recognize main point in a message. When reviewing a mission statement or commander’s intent, it is important that an officer extract the main point right away as that provides a necessary framework for absorbing the surrounding details. “Central Thesis Training” teaches students to quickly recognize the main point in an argument or text passage. Students are trained to find the anchor point or key elements in a message.

Visualize plans to see if they achieve goals. Research shows that both psychomotor and cognitive performance is enhanced if users engage in prior cognitive or mental rehearsal. Sub-skills here include: identify the initial and desired end states, establish a mental picture of the current state, visualize each step of the plan, check intermediate and final outcomes of each step as visualized for problems, and judge adequacy of the plan to reach intermediate and end states. This skill will be trained using “Visualization Rehearsal

Training”. Techniques from the simulation world are used to help students construct more effective mental simulations which play out the flow of events, and include branches and sequels of a course of action in the battlefield.

Construct a plausible story that ties all incidents together Training this skill uses “Connect a Point Training”, the goal of which is to teach students how to construct a plausible explanation that integrates all the independent facts in a message into a coherent whole. The student learns to consider information elements as related rather than in isolation. The training focuses on uncovering relationships, exploring alternative explanations of the information and keeping an open mind to detecting patterns.

Recognize fallibility and bias in own opinion. Research shows that people have a tendency to disregard new information that is inconsistent with their previously formed hypotheses. This training makes officers aware of the potential fallacies in their own plans and the need to consider and access new information. Sub-skills include: clearly specify your own opinion/theory, specify and seek out evidence that would invalidate your opinion/theory, recognize conflict and consistency between your opinion and new information, evaluate the evidence and make a judgment of whether the evidence as a whole supports or refutes the opinion/theory. “Weak Link Training” guides students to find the “weak links” in their own thinking.

Generalize from specific instances to broader classes. This skill is trained with “Progressive Broadening Training”, which exposes students to progressively more discrepant pieces of information to promote the ability to induce a broader classification from specific instances.

Adopt multiple perspectives in interpreting events. The “Three Look Training” approach teaches students to examine multiple perspectives by requiring them to view a given argument from least three vantage points. The different perspec-

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tives might include the enemy point of view, the end of the engagement, and key decision points. This training will help the student look for inconsistencies in the original plan that might be found by examining these other perspectives. The goal is to encourage students to “get out of the box” by examining the spatial and information aspects of the battlefield from other points of view.

Determine when to seek more information This skill is trained using “You be the judge” training. This training approach trains students to decide when to seek more information based on its cost and value. It teaches students when to stop information seeking and analysis and make a decision based on the data available. Students will be more aware that information and analyses have both value and costs.

Schoolhouse implementation

The critical thinking model, incorporating the eight critical thinking skills described above, has been integrated into the Command and General Staff College’s (CGSC) Intermediate Level Education (ILE) and Advanced Officers’ Warfighting Course (AOWC) curriculum. In ILE, the CT model and eight CTS are taught in five core course instruction blocks: Foundations, Leadership, Strategic Studies, Operational Studies and Tactical Studies. They are integrated into 16 course modules and 63 course lesson plans. In AOWC, the model and CTS are taught in 6 blocks of instruction, including Operational Warfighting, Division Operations, Brigade Operations, History, Leadership and Digits. It has been integrated into 45 lesson plans.



In the future, these CTS and the CT model could be integrated earlier into soldiers’ schoolhouse experiences. For example, they could easily be integrated into ROTC, West Point and Captain’s Career Course curricula. The earlier critical thinking skills are acquired, the more opportunity for practice and feedback exists throughout the soldier’s career. CTS would then be applied automatically and seamlessly when needed.

Web-based CT modules for distance learning

Training modules for the first two CTS, Frame the Problem and Recognize the Main Point in a Message, have been implemented on the web. This self-paced training is implemented in a layered



architecture on an open source web site. The remaining six CTS have been analyzed into their training elements and are tentatively scheduled to be developed by 2005. We are currently evaluating the two web based modules within Reserve Units. These web-based modules would be convenient and useful for officers’ self-development programs, Reserve Unit training, and ILE and AOWC distance learning programs.

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