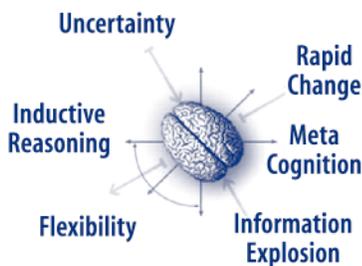


Training Critical Thinking Skills for Battle Command: How to Think, Not What to Think

Interest in training critical thinking (CT) skills has increased over the past 20 years in a variety of settings such as high school, higher education, corporations, government service, and nursing. Critical thinking skills are becoming especially important now as our world is changing at an ever-accelerating rate. Change is the status quo, not the exception.



Critical thinking skills (CTS) are also becoming recognized as more important to the Army as it looks to the uncertainties of future operations. Unimagined missions with no clear-cut school solutions will be executed. Army operations have become digitized and the capabilities of this digitization keep changing. Technology has created an information explosion. CTS are needed to adapt to a changing environment's complexity, uncertainty, ambiguity, and information overload.

Army officers already have good sets of knowledge and skills, but providing explicit direction in how to think or reason can broaden and deepen those skills and have a multiplier effect on performance. Traditional training does not provide explicit direction in how to reason or think.

What is Critical Thinking?

Critical thinking skills have been a topic of research and training in the education community for over fifty years. Despite this,

theories and research on CT are highly fragmented and there is no agreed upon definition of what CTS are, how to train them, or how to measure them.

One researcher, Dr. Diane Halpern, defines CT as the use of cognitive skills or strategies that increase the probability of a desirable outcome. It is purposeful, reasoned and goal directed. It involves evaluating the outcomes of our thought processes (e.g., how good a decision is), and evaluating the reasoning that went into a conclusion. There are two aspects to CT: (1) the basic skills and abilities to think critically and (2) the disposition or willingness to use those abilities. Both are needed. Some people may have the ability to think critically, but may not be willing to put forth the effort needed to do so. On the other hand, one may want to engage in critical thinking, but not have the required skills to do so.

There has been much debate about what counts as "critical thinking". Hundreds of CTS have been cited in the literature of education, philosophy and psychology and many ways of categorizing the skills have been proposed. Some examples of CTS are listed in the box below.

Examples of Critical Thinking Skills

- Questioning assumptions
- Framing a problem
- Inductive reasoning
- Deductive reasoning
- Mentally simulating plans
- Avoiding reasoning fallacies
- Meta-cognition
- Extracting meaning from information
- Adopting multiple perspectives

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*Improve critical thinking to
improve battle command
tactical performance*

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A Framework for Thinking about Critical Thinking

Critical thinking is a complex process. The diagram below shows a model that organizes the many factors that affect an individual's critical thinking processes.

Opportunities for CT arise when *situational conditions* make it desirable for a person to engage in CT. These conditions relate to the task or environment. People have *predisposing attitudes* that make it more or less likely that they will engage in CT, for example skepticism. *Experiential Consequences* are emotional reactions a person may experience while engaging in CT, which may affect his willingness to continue. *Moderating variables*, such as expertise, may affect both the quality of CT and the propensity to engage in CT. *Meta-*

tasks serve to define the general purpose of the CT activity. The *Critical Thinking State* shows three categories of skills and processes that are involved when an individual engages in CT. *Meta-cognitive* skills are those we use to monitor our own thinking. Meta-cognition is stepping back and observing ourselves - observing what we know and what we don't know, observing and judging the quality of our thinking, and making decisions about how to use our time and effort. The skills listed in the diagram are not exhaustive, but are only examples.

Research on Training Critical Thinking Skills

If CTS are to be trained, we need to know the answers to basic questions such as: Are CTS trainable? What methods are most effective in training CTS? Does training in one area generalize to CTS in other content areas? What are effective methods for promoting the generalizing of CTS from one area to another? Do different CTS require different training approaches? Can critical thinking dispositions be trained? How can CTS be measured? How should training be assessed?

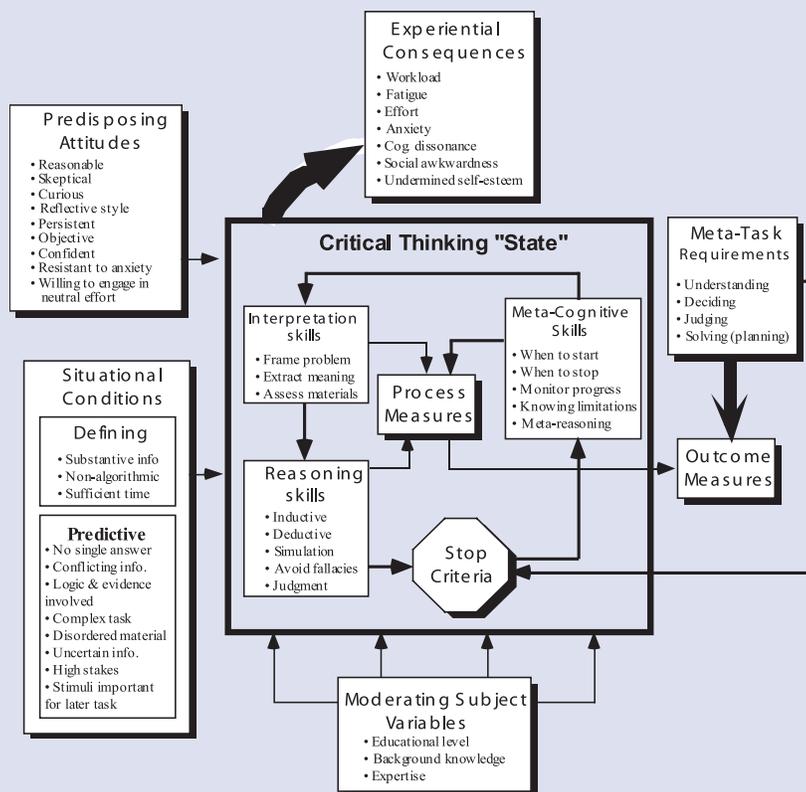
Research in education and psychology has not answered these questions conclusively. However, the findings are encouraging. There is research evidence that adults can be taught to improve their CT skills, although this conclusion varies with the specific skill. The results of one ARI sponsored study are shown below. The study compared a group of Army officers who received training in CT with a group which did not receive the training. An evaluation of the training showed that training in CT improved tactical planning performance.

A significantly higher proportion of participants trained in CT vs. untrained participants:

- Correctly restrained from over commitment of forces.

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A Framework for Thinking About Critical Thinking



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- Included sound tactical plan elements
- Detected problems with assumptions and goals
- Used a proactive time orientation
- Performed contingency planning
- Appropriately used ground forces

There is evidence that training can change dispositions to think critically. In fact, attitudes or dispositions are regarded by some as the most effective level for training. Training CT attitudes may involve more profound change in the person than teaching a new strategy.

One of the reasons for training CT in the Army is the emergence of novel and uncertain missions. It is important, then, that CTS be taught so that they will transfer to novel situations. Training techniques have been developed that encourage the transfer of CTS to new areas.

ARI is engaged in a number of projects to address research questions like the ones cited above and to develop training in critical thinking for Army officers. Three of these projects are described next.

ARI Projects in Critical Thinking Training

Training CD: Training to Think Critically on the Battlefield

ARI sponsored the development and evaluation of a training system for CTS that supports procedures in the Military Decision Making Process. The training system was developed by Cognitive Technologies, Inc. It was used and evaluated at the Army Command and General Staff College.

This training aims to improve the ability of Army tactical staff officers to quickly grasp the essential elements of a complex, uncertain, and dynamic situation, visualize those elements in terms of their units' goals, and take action in a

timely and decisive manner.

To accomplish these aims, four CTS were chosen for training. The first skill is keeping the goal of the mission upper most in mind and having it drive all aspects of planning. The second skill is time orientation - knowing when and how to be proactive, predictive, and reactive in planning and how to turn predictive courses of action into proactive courses of action, or reactive into predictive courses of action. The third skill is identifying problems in your mental model of the situation and then correcting them. Problems to look for include unreliable assumptions, missing information, and conflicts between information sources, tasks, or purposes. The fourth skill involves challenging your plan to see how and why it might fail even if you are certain it will succeed, and then changing the plan to deal with unaccounted for factors.

The training system includes structured instruction, historical examples, guided practice using practical scenarios, detailed feedback, and performance measures. It is accessible either through the CD-ROM, available from ARI, or over the World Wide Web. The training is suitable for classroom instruction, training in the field, or distance learning. Reports documenting this work are available.

Workshop on Critical Thinking for Battle Command.

In December 2000, an invitational Workshop on Critical Thinking Skills for Battle Command was held at Fort Leavenworth. Participants included experts in academic research and Army officers in fields related to training CTS.

Presenters at the Workshop provided an overview of current research in CT, adult

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learning, and CT training and extended discussions provided a forum for identifying and discussing issues related to training CT in the Army. Participants developed recommendations for training CT in the Army and directions for future Research and Development.

Preliminary recommendations from the Workshop include the development of valid evaluation methods and measures of CT. Historically, measurement of CT has been problematic. However, without valid evaluations, we can't know if the training is effective. Participants also recommended an examination of the Army cultural context for critical thinking. If the culture doesn't support the use of CTS, they won't be used not matter how effective the training.

A Special ARI Report will be published in September 2001, which will contain Workshop presentations and describe the discussion recommendations.

Web-Based Training for Critical Thinking Skills
As a preliminary step to developing web-based

CT training, this project reviewed the concepts and research on critical thinking in fields of philosophy, education and psychology. From this review the model of CT described earlier was developed. Based on a survey of Army officers that focused on situations and conditions on the battlefield, 13 key thinking skills important for successful performance were identified. A report documenting the literature review and CT model is available. This training is expected to be completed in 2002.

Conclusion

Under current training programs, most officers are left to somehow develop their critical thinking skills on their own. Training of these skills is an implicit by-product of formal education, training exercises and self-development. Explicit training in critical thinking holds great promise to give Army officers added skills in dealing with the uncertainties of the 21st century.

For additional information, contact Dr. Sharon Riedel Leadership Development Research, Unit, ARI_LDRU@ari.army.mil.