Fueling the Force: Exploring Leader Priorities

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ABSTRACT

Army Majors are organizational-level leaders with the responsibility for planning, organizing and leading large unit formations, working on high level staffs and running the Army day to day. "Fuel Priorities" is an experiential learning exercise designed to examine their critical thinking and decision-making and communication skills in a deceptively familiar setting. Conducted early in their academic year at the Command & General Staff College, the exercise provides a common frame of reference for further lessons in critical thinking, while preparing them for a difficult staff planning exercise at the end of the year. This paper describes the CGSC experience with incorporating a "bite-sized" practical exercise into the professional military decision-making curriculum at CGSC with some thoughts on the generalizability of the insights.

INTRODUCTION

Each year, more than 1500 Majors from the United States Army, Navy, Air Force, Marines, international officers and operational leaders from US Government agencies of equivalent rank, attend the United States Army Command & General Staff College (CGSC) at Fort Leavenworth, Kansas. The year-long course prepares them for leadership roles where proficiency in critical thinking, decision-making, collaboration and communication skills are crucial. The college applies principles of adult learning theory and experiential learning to engage students across their learning styles and preferences. With many important skills to develop and disciplines to explore, and a finite number of contact hours, the faculty actively search for ways to get the most educational value per hour in the classroom. One high payoff method is to use practical exercises that develop cognitive skills that are grounded in professional contexts that leverage their experiences and specific domain knowledge. This paper describes one such exercise where the deceptively simple task of communicating priorities of support for fuel is tested in a thought experiment designed to expose important dimensions of communication, risk, sense-making and decision-making in a common tactical problem: how to allocate fuel to units that are low on fuel while engaged in combat.

LITERATURE REVIEW

Facione (2011) offers a detailed roadmap for educating students in critical thinking as applied to pragmatic, problem finding and solving. He provides a comprehensive, accessible and practical synthesis of the state of the art in contemporary critical thinking practice. The ten hour introductory and foundational Critical Thinking course at CGSC is taught early in the school year and aligns well with Facione's summary of the field.

Long and Morrison (2011) describe the typical, habitual, instinctive, patterns of professional military thought as "paradigmatic thinking". When a leader must decide quickly, under a time pressure, this paradigmatic thinking can create a typical, predictable professional response to problem solving and environments. They describe a military thinking model on a continuum that includes paradigmatic thinking, creative thinking, critical thinking, design thinking, and reactive thinking (Appendix 3). Perez (2011) suggests artful design thinking can improve the ability to describe the environment, frame a problem, and improve rational planning. McConnell(et.al, 2011) call for an educational approach that exposes officers to multiple modes of thinking that are needed to understand, appreciate and thrive in environments characterized by chaos, uncertainty, time pressure and competing values.

The Army's Operations field manual, *FM 3.0 Operations*, describes the Army's planning and problem solving methods as the Military Decision Making Process (MDMP). The battle field is a complicated place and Army planning doctrine recognizes that not every contingency can be precisely planned for. The MDMP produces operations orders that direct subordinate units to take specific actions when details can be specified. For times when uncertainty and complexity preclude detailed, precise plans, the Army uses the concept of "Commander's Intent" to provide broad principled guidance that allows subordinate leaders to decide what to do in a way that is consistent with the senior leader's broad vision and purpose. The power and flexibility of the Commander's Intent concept rests directly on the effective communication between leader's, supported by a common frame of reference and mutual understanding of shared values and concepts.

The Army's *Learning Concept* (TP 525-8-2; 2010) calls for the use of experiential learning in the classroom to accelerate learning. It recognizes further that practical exercises that use a professional context are especially effective at engaging military adult learners by connecting the classroom activity to their practical experiences and their desire to learn things that they will be able to apply in future assignments.

Paparone and Tenant (2011) address the development of and appreciation for reflective learning skills in Army

organizational leaders. They suggest the cognitive skill sets that are so important to direct leaders can be inadequate and often problematic when dealing with complex problems that need deeper and more nuanced perspectives. They identify needs for multiple perspectives, open-ended questioning and patience in order to avoid a rush to certainty in situations where the instinctive response of paradigmatic thinking can be counter-productive.

Crandall, Klein, and Hoffman (2006) describe how tactical decision games (TDG) can reveal an organization's formal decision making as a baseline for developing critical thinking and as reinforcement of norms for training purposes. By crafting practical exercises around decision-making situations, student reasoning can be explored in detail by means off reflective learning.

Intuitions of uncertainty often lead to unreliable estimates of future probabilities, particularly when experiences are not related to the problem domain (Beyth-Marom & Dekel, 1985). Simiilarly, chaotic and complex environments challenge decision-makers accustomed to planning for certainty and control (Johnson, 2007). Decision-maps and visual problem framing offer a way to balance the tensions between time-constrained multiple stakeholders in group problem-solving settings (Eden & Ackerman, 2010).

Expert practitioners and novices differ in the ways they frame, visualize, and process tasks in their areas of expertise, and some of the challenges experts face when confronted with problems outside of their areas of expertise. One of the key elements of effective practical exercises is the reflective and reflexive discourse between group members as they witness the competition of ideas between competing problem frames and assumption sets. A good practical exercise is one whose design ensures that such discourse must occur. Exposure to how experts have framed the problem and exploring the differences in approach is an important component of such learning, but only after the students have committed to their own understanding. The emotional engagement in creating a solution creates the conditions where effective reflective learning by means of professional discourse can emerge (Mayer,1991).

Teachers can model reflective learning by offering their personal insights and approaches for consideration, but without claiming to have the authoritative solution. This can demonstrate their vulnerability as learners and the trust they have for the students who may be able to see how "wondering out loud" in a trustful collaborative group can help generate new insights through the network effect. This is a form of emotional intelligence that is a key component of effective collaboration, which the Army has identified as a core leadership attribute (Dana & Yendol-Silva, 2003).

Michaelsen and Knight (2004) advocate the use of individual preparatory assignments to facilitate collaborative learning in the classroom. These can lead to more productive use of classroom time as a group and facilitate reflective learning that's grounded in and proceeds from individual preparation and commitment. They recommend lesson designs that incorporate activities and assignments before, during and after the classroom experience as part of a complete lesson plan.

INITIAL DESIGN REQUIREMENTS

In the initial planning session for the experiential learning exercise, key faculty members and subject matter experts described the problem and opportunity space as one in which the lesson would meet the following criteria:
1. Use a common military experience to reduce setup time. It should be related to planning tasks and scenarios found later in the academic year.
2. Provide enough information for students to frame the problem while having enough uncertainty to require them to make assumptions, which could be explored and discussed using critical thinking skills.
3. Require the students to come to class with an individual solution. This would commit them to a position and provide an opportunity to see different ideas, values, and assumptions compete publicly.
4. Place time constraints to introduce time pressure to make a group decision and tohave time for debriefing and reflective analysis in class. This would create conditions for observing reactive thinking in action.
5. Provide faculty facilitation with support materials with background information and potential lines of discussion.
6. Have the faculty to go through the exercise as a group during lesson preparation in order to experience the lesson from the inside.
7. Ensure there is a strong linkage between the Critical Thinking course material and the lesson design and teaching note.
8. Include an individual reflective written exercise after the class, to reinforce reflective learning.

DESIGNING & DEVELOPING THE PRACTICAL EXERCISE

The design team took the guidance and developed the following set of educational objectives. In a group setting, students will

1. Apply the principles, concepts and processes of critical thinking explored in the C120 Critical Thinking course.
2. Create environmental and problem frames to facilitate problem solving.
3. Identify personal and group bias in problem finding, and solving.
4. Analyze the use of assumptions and the effects of logical fallacies in problem solving
5. Conduct individual reflective learning through journaling
6. Examine the concepts of Commander's Intent, and prioritization in a practical setting
7. Review the principles of Sustaining the Force with fuel replenishment operations.

To meet these objectives, the team designed a one hour scenario that featured a time-constrained prioritization scheme for conducting refuel operations of a large unit consisting of three subordinate task forces involved in direct fire combat, in complex terrain featuring very limited

road networks. They coordinated with the Critical Thinking course authors to ensure that key concepts, terms, processes and outcomes were linked. They designed a set of leading questions for facilitators to guide reflective discussions in the second hour of the lesson. They created a space in Blackboard and Sharepoint for individual reflective learning essays and group discussions. After refinements were made from piloting the lesson with several different sets of faculty and students, the lesson was broadly taught to the student population. It took six weeks to go from concept to being ready for the first mass teaching.

SUMMARY OF THE EXERCISE

The faculty sets-up the exercise in the final minutes of the previous class by providing students with the following information and a handout (See appendix 1 for a sketch and the complete instructions officers receive). No additional information was provided, and students are told that this is individual work (no collaboration) and that they have only their existing military experience to draw upon.

1. You (the officer) are responsible for providing fuel support to the brigade (the large unit).
2. The brigade (the large unit) has three subordinate battalions (small units), engaged in direct fire combat.
3. The three battalions are fighting on the east side of a mountain range, which can only be crossed by a single lane road, which is the supply road connecting the support base to the fighting battalions.
4. You are located at a 4 way road intersection on the east side of the supply road where it emerges from the pass.
5. One single lane road connects your location to that of each of the three fighting battalions.
6. The roads are so narrow that fuel trucks cannot turn around; once they start to go down the road, they must got the entire length of the road to the fighting battalions.
7. Battalion 1 is 20 kilometers to the northeast of your location. Battalion 2 is 20 kilometers due east of your location. Battalion 3 is located 20 kilometers southeast of your location.
8. The brigade commander (the senior leader) has given the following guidance:
   a. Battalion 1 is our main effort. It must succeed for the brigade to succeed. If it fails, then the brogade fails.
   b. Battalion 2 supports battalion 1's southern flank. If Battalion 2 fails, then the probability of Battalion 1 succeeding is cut in half.
   c. Battalion 23 supports battalion 2's southern flank. If Battalion 3 fails, then the probability of Battalion 2 succeeding is cut in half.

Status Code	Fuel Status %	Probability of Mission Accomplishment
Green	90-100%	95%: minor risk
Amber	70-90%	80%: significant risk
Red	50-70%	60%: major risk
Black	<50%	30%: will most likely fail

9. My priorities for support are: Battalion 1, then battalion 2, then Battalion 3.
10. This is the current situation:
    a. The Brigade SOP indicates that each subordinate Battalion can carry a maximum load of 100,000 gal of fuel (100K)
    b. The Brigade supply unit has 30 fuel trucks, each of which can carry 5K of fuel.
    c. The normal method of fuel resupply is for these fuel trucks to carry fuel to the battalions and then return.
    d. Each battalion is fighting in its sector at the end of a narrow single lane supply road.
    e. Each battalion reports that they are now 50% on fuel and desperately need resupply, 50K each.
    f. Your fuel requirement is 150K, to bring the entire brigade to 100% on fuel.
    g. All your fuels trucks, with 150K of fuel, in 5K increments, are in a convoy on the west side of the single lane road through the mountains
    h. That supply road is under attack, and you can't be sure when or if the supply road will be closed by the enemy
    i. The convoy leader says he will try to fight to get one fuel truck through at a time.

11. You are on the east side of the mountain pass and must decide where to send each individual truck as it emerges from the mountain pass. Once you send them, there's no calling them back.
12. Instructions: fill out the priority table below, to show where you would send each truck in sequence, as they come through the pass:

Qty (1,000s)	%	Bn 1	Bn 2	Bn 3
100	100%			
95	95%			
90	90%			
85	85%			
80	80%			
75	75%			
70	70%			
65	65%			
60	60%			
55	55%			

CONDUCT OF THE LESSON

For homework, officers were issued a copy of the problem and individually prepared their solution for class the next day. They were instructed to do individual work and not to talk with other students. When class began the next day, the lesson was conducted in the following sequence.

1. As soon as class started, students were given two minutes to finalize their answers in silence.
2. Students were asked to choose a member of the class to be the leader
3. The student leader was told to go outside the classroom where he would have ten minutes to prepare a strategy for getting the group to consensus in twenty minutes upon his return.
4. After the leader left, the remaining students were asked to silently and individually record what their strategy would have been to get the group to consensus if they had been selected as leader and then talk about how they would do it for about five minutes.
5. The leader was given no new instructions in the hallway, except to reinforce that it was important to "get it right" and that the group answer would be scored against a "school solution of experts".
6. Upon returning to the classroom, the student leader took charge and began to get the group to consensus.
7. If the group struggled and created their own time pressure, they got to use all of the promised 20 minutes. If the group did not struggle with experiencing time pressure, the facilitator reduced the time available until they felt rushed and became aware that the rules could change.
8. The instructor team observed behavior until the time was up and a consensus was achieved.
9. Steps 1-8 normally took about 40 minutes, and the students got a 10 minute break.
10. Upon return, in the second hour, the facilitator asked a series of directed questions to unpack student experiences and generate discussions, and noted the use of critical thinking concepts and terms in the discussion. Classroom whiteboards were used to facilitate discussions as well as summary slides from previous lessons as needed.
11. The facilitator filled in the gaps with additional commentary and asked leading questions to make additional connections to Critical Thinking.
12. The facilitator handed out a "school solution" of experts, compiled as the average of over 400 officers and faculty who had taken the exercise. The group consensus was compared to the school solution.
13. If no student made the observation, then the facilitator asked the students why they should accept that as a school solution and what the hidden biases and fallacies could be.
14. Students were asked to consider what kinds of problems there could be where the averages of experts would not be not a good strategy. They were asked if they considered themselves to be experts in the problem they had just experienced and why. They were asked how they might adapt their behavior based on their perception of expertise.
15. The facilitator explored the assumptions the group used and shared insights about how other classes had approached the same problem in order to reveal the remarkable variety of methods that had emerged over multiple iterations.
16. Students were asked to consider how power relationships, group dynamics, learning styles and background experiences could have affected their process and how changes in these areas might shift the environmental and problem frames altogether.
17. Finally, students were given five minutes to reflect silently on note cards about their experience in the classroom and were shown how to use the Blackboard and Sharepoint discussion thread to record their reflective learning essays within the next 72 hours.
18. See Appendix 2 for a complete list of standardized questions that have been developed for these kinds of practical exercise

GENERAL RESULTS

Following a thorough after-action review that included faculty and student questionnaires and focus groups, and a review of student reflective learning essays, the design team concluded that all primary lesson objectives had been met. The college decided to make the exercise available to distance learning campuses through the web because of its flexibility The design team observed the exercise was frequently referred to in follow-on lessons that dealt with communicating priorities of support and clearly communicating Commander's Intent. In future lessons a great number of additional planning considerations and variables are introduced for realism, but many of the same discussion points developed in the original practical exercise lesson apply.

The faculty has supported the continued use the Fuel Priorities practical exercise. Their judgment has been supported by the measured feedback from the college's quality assurance office, responsible for rigorous quantitative and qualitative measurements of student learning outcomes. The year over year measured student satisfaction levels have shown a significant increase in overall satisfaction when compared with traditional lecture methods of delivering critical thinking and sustainment lessons. Students have chosen to highlight the practical exercise experience in their open-ended narrative comments.

Faculty after-action reviews have been positive in describing the use of the exercise in their classrooms, particularly as it brought out tactical planning considerations that were seen again in future staff planning lessons. They appreciated how the focus of the lesson quickly centered on issues of student leadership, collaboration and dialogue. They observed that there was just enough structure provided in the lesson plan to ensure that important educational outcomes were achieved, yet kept the responsibility for decision-making, collaboration and results directly on students. The college has shared the exercise with other partner schools in the Army Education System and the results described above have been typical of what these other schools have found.

Faculty appreciated the technique of experientially learning how to teach the lesson by doing. The structured preparation assignments and follow-on reflective learning essay were useful in developing reflective insights associated with meta-cognition.

Asking students to come to class with their own recommendations and then asking them to commit in writing on their own strategy for getting to consensus,

created the conditions for spirited discussion in the group problem solving process. The act of committing to a position in writing made students more willing to engage on procedural and content debates. Asking them to record their consensus strategies made them think about how the group should be getting to consensus when they started to feel time pressure. This generated interesting group dynamics.

SPECIFIC INSIGHTS

1. Students and faculty were amazed at the number of different prioritization strategies that had been generated by individuals. In a group of 16 students it was normal to see at least three distinctly different strategies that could have been used to create the priority list.
   a. Balanced horizontal: students fill equally and laterally, beginning with Battalion 1, then 2, then 3 in order to bring each Battalion along similarly.
   b. Staggered fill: these students filled Battalion 1 partially and quickly, and then began to provide some to Battalion 2 and 3 to get them better, but never equal to battalion 1
   c. The "Vulcan" approach: some officers with strong math backgrounds tried to compute the mission accomplishment value of each of the 30 squares to compute the mathematically optimum sequence of decisions. They discovered that these computations were extremely vulnerable to slight changes in the heuristic values provided in the SOP.
   Subject matter experts recommended the following idea: provide one fuel truck to each Battalion, in priority 1,2,3 in order to bring the entire Brigade out of Black status and into Red, which they analogized as "raising a quantum level". Then fill Battalion 1 until it moves into Amber status. Then fill battalions 2 and 3 equally until they achieve Amber status. Repeat until all three are in Green and then filled to 100%.
2. Students were asked to compare the individual strategy they chose for creating their own priority list and the strategy they would have used to get the group to consensus, and almost without exception, there was a very strong connection between their own preferred individual strategy and their idea of an effective group consensus building strategy. That insight was followed up with an exploration of the concept that there can be a distinct difference in what makes sense for an individual and how that individual might lead a group sense-making effort. Reflections on this concept were frequently found in the student reflective essays.
3. Time pressure acted as an important driver to force students into reactive or paradigmatic thinking. It was an important discussion point to unpack what coping strategies they employed and what simplifying assumptions they made in order to see the tradeoff considerations of their default choices. Some students reflected on this very point in their essays when they observed that it was important to be explicit about what simplifying assumptions they make and to at least consider the consequences before proceeding further towards reactive thinking.
4. The success of this practical exercise encouraged the development and use of other "bite-sized" experiential learning exercises similarly aimed at putting new cognitive skills into action. Where these exercises have been used, the results have been similar: a high degree of student engagement, memorable learning experiences that are reinforced in later, deliberate planning exercises, and an appreciation for how quickly new insights can be accepted and internalized when connected to solving typical problems within the profession.
5. The second hour of reflective discussion was crucial for making the connections to previous critical thinking lessons and concepts. Facilitators took care that the discussions didn't become a replay of the first hour or fall back into discussions of what might have been. The exercise must be seen simply as a tool to help the class examine their thinking processes as individuals and as a group rather than over-focusing on specific details of problem solutions.
6. A good follow-on exercise was done to begin brainstorming all the variables that would have to be considered to conduct the scenario under realistic conditions. These results were carried forward into future detailed planning sessions and established a connection with the doctrine on Army sustainment.

CONCLUSIONS

The Army Command & General Staff College's (CGSC) enhances the education of field grade officers (organizational leaders) through the use of practical exercises aimed at making decisions in common situations, that are informed by professional and personal experience, and use professionally relevant context to emphasis relevance. These exercises expose students to typical problems that require and understanding and management of complexity, and provide an opportunity for them to exercise critical and creative thinking, communication skills and collaboration. By designing key activities for before, during and after sessions of the lesson, both professional and reflective learning can take place. Emphasizing dialogue and discourse among prepared professionals set the condition for later individual reflective learning to take place.

The "Fuel Priorities" exercise significantly enhanced the student and faculty ability to visualize, understand and apply crucial critical thinking skills needed by Army officers to be successful in an uncertain, chaotic environment.

The exercise quickly uncovered both the limits and the practical utility of experience-based paradigmatic thinking. It helped students and faculty examine the relationship between "paradigmatic thinking" and critical thinking and

how the two modes of cognition can be mutually supporting.

Faculty were supported by means of a detailed teaching note and an experiential learning preparations session where faculty actually participated in the conduct of the lesson.

Successful completion of this project reinforced the program of experiential learning across the curriculum, and allowed CGSC to continue to develop partnerships with other schools and organizations working in this area of educating leaders for uncertainty.

The author encourages collaboration and development of adaptations of this idea, and is eager for outreach and collaboration for applying and exploring these ideas in other settings.

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APPENDIX 1

Sketch of the scenario students receive. No additional information was provided and the students were explicitly told that they had only their existing military experience to reply upon.

BCT Cdr's priority of support: A,B,C

Mission Code

Green	Minor risk
Yellow	Significant risk
Red	Substantial mission risk
Black	Cannot accomplish mission

Qty (1,000s)	%	Bn 1	Bn 2	Bn 3
100	100%			
95	95%			
90	90%			
85	85%			
80	80%			
75	75%			
70	70%			
65	65%			
60	60%			
55	55%			

Bn fuel status
each Bn can store 100k in their FSC
each Bn is currently at 50% fill

Missions:

Bn 1   The decisive operation
Bn 2   The primary shaping operation in support of TF A
Bn 3   The secondary shaping operation, securing the flanks

If TF missions fail:

Bn 1   the BCT fails
Bn 2   TF A will have a 50% chance of success
Bn 3   TF B will have a 50% chance of success

Situation:
The single LOC is under attack
The BSB is pushing through fuel trucks (5Ks) as fast as possible
It is very uncertain, and there are no ways around the fighting
Cannot cross level between Bn's due to compartmentalized terrain
You must direct the fuels trucks to Bn 1, Bn 2, Bn 3 as they come through
BSB has 30 total fuel trucks available, if all come thru
Identify your priorities for resupply in the grey boxes,1-30

Appendix 2
Discussion questions for all experiential learning Practical Exercises

Discussion Part 1: General discussion questions of the group
1. Describe your thinking and how you created the solution?
2. How did the group dynamics effect the group's decision and problem solving process?
3. What was your reaction to this?

Ask the Student Leader the following questions:
1. What were you very clear on?
2. What were you uncertain about?
3. What assumptions did you make? Why were they necessary
4. What made you comfortable? Uncomfortable?
5. How supportive was your group?
6. What decisions did you make?
7. What would you do differently? Why?
8. What was satisfying?
9. If all the students outranked you, what difference would that have made?
10. If this problem had been well outside of your area of expertise, what would you have done differently?

Discussion part 2: As a group, ask the following questions:

1. What was the problem?
2. What were the important considerations?
3. How did you prioritize?
4. Did you consider any other alternative approaches?
5. What was hard about the problem?
6. What was easy?
7. For the leader, what was the greatest obstacle to getting consensus
8. For the staff group members, did anyone feel like their voice wasn't heard? Why? Did anyone feel like they didn't want to be heard? Why?
9. Offer the class instructor notes/observations.
10. Do you feel that your thinking will change in the future when you are presented with complex problems?
11. How do you think you can use what you experienced in this lesson?

After class, NLT than 72 later, students will log onto the C120 Critical Thinking Module Discussion forum to answer the reflection questions below. Students will describe their thought process during the practical exercise. They should use critical and creative thinking terminology, concepts, processes, models, and principles to describe their thinking during the exercise. Students will use their answers to the initial questions above to refine their answer to the following questions:

1. How did you arrive to a solution in the exercise?
2. Describe the critical and creative thinking you used during the exercise.
3. Describe the critical and creative thinking skills you did not use during the exercise. Explain why not.
4. Describe any impediments to critical and creative thinking that you observed during the exercise.
5. Describe how your staff group interacted and how they used collaboration skills.
6. Compare the problem to how Rittel and Webber describe Wicked Problems.
7. How would you describe your critical and creative thinking skills from your previous operational experiences?
8. Describe how you might apply what you learned in this module to future anticipated professional experiences.

Reflective Journal Rubric: an adaptation of Facione's (2011) generic critical thinking rubric

Strong: Consistently does all or almost all of the following

- Accurately interprets evidence, statements, questions
- Identifies salient arguments, reasons, claims and warrants (both pro and con)
- Thoughtfully analyzes and evaluates major alternative points of view
- Draws warranted, judicious, non-fallacious conclusions
- Justifies key results and procedures, explains assumptions and reasons
- Fair mindedly follows where evidence and reasons lead
- identifies and applies processes, concepts and principles of critical thinking in action

Acceptable: does most or many of the following
- Accurately interprets evidence, statements, questions
- Identifies salient arguments, reasons, claims and warrants (both pro and con)
- Thoughtfully analyzes and evaluates major alternative points of view
- Draws warranted, judicious, non-fallacious conclusions
- Justifies key results and procedures, explains assumptions and reasons
- Fair mindedly follows where evidence and reasons lead
- Identifies and applies processes, concepts and principles of critical thinking in action

Unacceptable: does most or many of the following
- misinterprets evidence, statements, questions
- fails to identify strong relevant counterarguments
- ignores or superficially evaluates obvious alternative points of view
- draws unwarranted or fallacious conclusions
- justifies if you results or procedures, seldom explains reasons
- maintains or defends views based on self-interest or preconceptions regardless of the evidence or reasons

Weak: does most or many of the following
- offers biased interpretations of evidence statements and questions or the points of views of others
- fails to identify or hastily dismisses **strong** relevant counterarguments
- ignores or superficially evaluates obvious alternative points of view
- argues using fallacious or irrelevant reasons and unwarranted claims
- does not justify results or procedures nor explain reasons
- maintains or defends views based on self-interest or preconceptions regardless of the evidence or reasons
- exhibits close-mindedness or hostility to reason

Examples of how different leaders chose to construct their group process.

1. Directive: the leader dictated the process the group would use and managed the problem-solving process to that standard.
2. Semi-collaborative: the leader offers his strategy but invites improvements and or alternatives from the group.
3. Collaborative: the leader invites discussion on ways to proceed and manages a consensus-building process.
4. Adaptive: regardless of initial consensus process, the leader and or group elects to amend or adapt their process based on immediate feedback with a view towards time constraints and pressure to succeed

APPENDIX 3
A Military Thinking Model (Long & Morrison, 2011)