TEACHING GUIDELINES - A CRITICAL THINKING MODEL INTRODUCTION

Critical Thinking: A Definition

Critical thinking is that mode of thinking about any subject, content, or problem - in which the thinker improves the quality of his/her thinking by skilfully analysing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking. It assumes (or takes for granted) agreeance to rigorous standards of excellence and careful (mindful) command of their use. It entails effective communication and problem-solving abilities, as well as a commitment to overcome our native egocentrism and sociocentrism (or group egocentrism).

The Fundamental Concepts

Concept 1 – The Elements of Reason – used to analyse thinking. Critical thinkers understand the importance of taking theirs and other's thinking apart in order to analyse if for flaws. The eight (8) <u>elements</u> <u>of reason</u> (or parts of thinking) provide a general logic to all thinking that occurs. If you understand the parts of thinking, you can ask the crucial questions implied by those parts, i.e. you can analyse thinking by identifying its purpose, and then questioning its information, conclusion(s), assumptions, implications, main concept(s), and point of view.

Concept 2 - The Universal Intellectual

Standards - used to assess thinking. One of the fundamentals of critical thinking is the ability to assess one's own reasoning. To be good at assessment requires that you consistently take apart yours and other's thinking and examines the parts with respect to the intellectual standards (or standards of quality). This is done by using criteria based on clarity, accuracy, precision, relevance, depth, breadth, logicalness and significance. Critical thinkers routinely apply the intellectual standards to the elements of reasoning. They check their reasoning for accuracy, clarity, precision. relevance. depth, breadth, significance, logic, and fairness in order to identify its strengths and weaknesses.





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¹ Foundation for Critical Thinking, Online at website: www.criticalthinking.org Guidelines on Critical Thinking Concepts and Tools - Version 2.0 dated 7 Jun 07 by LTCOL Deb Bradford

- consequences; and
- solutions to complex problems.

A Model of Teaching: Critical Thinking Concepts and Tools (CTCT)

The Critical Thinking Concepts and Tools (CTCT) Model is a teaching model developed by leading US authorities in Critical Thinking -Paul and Elder (2006)1. Your role as an instructor is to apply the model in each of your classes in such a way that you teach the CT concepts within the logic of your content area and you develop the CT tools of your students during the process.

This guide aims to provide you with CTCT Model subject matter expertise.

Concept 3 - The Intellectual Traits - used to improve thinking. Finally, you must be willing to creatively reconstruct your thinking to make it better by being fair-minded (overcoming the natural tendency of the mind to be rigid and to want to validate your own current thoughts rather than improving them.) Critical thinkers therefore strive to develop essential traits or dispositions of mind, intellectual traits. These traits include intellectual integrity, intellectual humility, intellectual sense of justice, intellectual perseverance, intellectual fair-mindedness, intellectual confidence in reason, intellectual courage, intellectual empathy, and intellectual autonomy.

The Cognitive Skills, Abilities and Dispositions of **Critical Thinkers**

The core critical thinking skills required of master thinkers include: an ability to analyse, infer, explain, interpret, evaluate and self-regulate. Not only must a master thinker have these abilities, but must also be disposed to use these abilities routinely. Thus, the ideal critical thinker can be characterised not merely by the cognitive skills he/she possesses, but also by how he/she approaches life and living in general.

The Result -

A well-cultivated critical thinker:

- raises vital questions and problems, formulating them clearly and precisely;
- gathers and assesses relevant information, using abstract ideas to interpret it effectively:
- comes to well-reasoned conclusions and solutions, them against relevant criteria and testing standards:
- thinks open-mindedly within alternative systems of thought, recognising and assessing, as needs be, their assumptions, implications, and practical
- communicates effectively with others in figuring out



soldiers to understand their own thinking and emotions.

Critical Thinking Concepts and Tools

CT Tools - is a metaphor for the intellectual skills, abilities and dispositions required by master thinkers.





3 CRITICAL THINKING CONCEPTS



There are many standards appropriate to the assessment of thinking as it might occur in this or that context, but some standards are virtually universal (that is, applicable to all thinking). These universal intellectual standards include: clarity, accuracy, precision, relevance, depth, breadth, and logic.

How well students reason depends on how well they apply these universal standards to the elements of reasoning.

What follows are some guidelines helpful for students as they work toward developing their reasoning abilities:

order to learn how to upgrade their thinking. First, they need to be able to

identify the 8 parts of their thinking (the elements of reason), and then they need to be able to assess their use of these parts of thinking against a set of standards, as follows:

Firstly, all reasoning:

- 1. has a purpose
- 2. is an attempt to figure something out, to settle some question, to solve some problem
- is based on assumptions
- 4. is done from some point of view
- 5. is based on data, information. and evidence
- expressed through. 6. is and shaped by, concepts and ideas
- 7. contains inferences by which we draw conclusions and aive meaning to data
- 8. leads somewhere. has implications and consequences

Secondly, you must question "What appropriate intellectual standards do you need to assess the elements of reason or the parts of your thinking?"

CT - Step 2	- Clarity	A critical thinker consider the elements of reason with sensitivity to the	
Intellectual	- Accuracy	inteBectual standards	
Standards	- Precision		
otantaarao	- Relevance	ARA	
Testing the	- Depth	A good start	
quality of your thinking	- Breadth	What	
	- Logic	standards might you	
	- Significance	add for your discipline?	
	- Fairness	diam'r a sea	

- 1. All reasoning has a PURPOSE:
 - o Take time to state your purpose clearly
 - o Distinguish your purpose from related purposes
 - Check periodically to be sure you are still on target
 - o Choose significant and realistic purposes
- All reasoning is an attempt to FIGURE SOMETHING OUT, TO SETTLE SOME QUESTION, TO SOLVE SOME PROBLEM:
 - o Take time to clearly and precisely state the question at issue
 - Express the question in several ways to clarify its meaning and scope
 - o Break the question into sub questions
 - Identify if the question has one right answer, is a matter of opinion, or requires reasoning from more than one point of view
- 3. All reasoning is based on ASSUMPTIONS:
 - o Clearly identify your assumptions and determine whether they are justifiable
 - o Consider how your assumptions are shaping your point of view
- 4. All reasoning is done from some POINT OF VIEW:
 - o Identify your point of view
 - o Seek other points of view and identify their strengths as well as weaknesses
 - o Strive to be fair-minded in evaluating all points of view
- 5. All reasoning is based on DATA, INFORMATION and EVIDENCE:
 - o 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
 - o Make sure you have gathered sufficient information.
- 6. All reasoning is expressed through, and shaped by, CONCEPTS and IDEAS:
 - o Identify key concepts and explain them clearly
 - o Consider alternative concepts or alternative definitions to concepts
 - o Make sure you are using concepts with care and precision
- All reasoning contains INFERENCES or INTERPRETATIONS by which we draw CONCLUSIONS and give meaning to data:
 - o Infer only what the evidence implies
 - · Check inferences for their consistency with each other
 - o Identify assumptions which lead you to your inferences
- 8. All reasoning leads somewhere or has IMPLICATIONS and CONSEQUENCES:
 - o Trace the implications and consequences that follow from your reasoning
 - o Search for negative as well as positive implications
 - o Consider all possible consequences

Universal Intellectual Standards

Universal intellectual standards are standards which must be applied to thinking whenever you are interested in checking the quality of reasoning about a problem, issue, or situation. Critical thinkers have command of these standards and use them routinely. To help students learn them, instructors should pose questions which probe student thinking; questions which hold students accountable for their thinking; questions which, through consistent use by the instructor in the classroom, become internalised by students as questions they need to ask themselves. The

ultimate goal, then, is for these questions to become infused in the thinking of students, forming part of their inner voice, which then guides them to better reasoning. The following are the most significant universal standards:

- CLARITY: Could you elaborate further on that point? Could you express that point in another way? Could you give me an illustration? Could you give me an example? Clarity is the gateway standard. If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we don't yet know what it is saying. For example, the question, "What can be done about the education system in the Army?" is unclear. In order to address the question adequately, we would need to have a clearer understanding of what the person asking the question is considering the "problem" to be. A clearer question might be "What can educators do to ensure that students learn the skills and abilities which help them function successfully on the job and in their daily decision-making?"
- ACCURACY: Is that really true? How could we check that? How could we find out if that is true? A statement can be clear but not accurate, as in "Most soldiers are over 120 kg in weight."
- PRECISION: Could you give more details? Could you be more specific? A statement can be both clear and accurate, but not precise, as in "CPL Blocks is overweight." (We don't know how overweight CPL Blocks is, one kg or 50 kg.)
- RELEVANCE: How is that connected to the question? How does that bear on the issue? A
 statement can be clear, accurate, and precise, but not relevant to the question at issue. For
 example, students often think that the amount of effort they put into a course should be used in
 raising their word picture or grade in a course. Often, however, the "effort" does not measure
 the quality of student learning; and when this is so, effort is irrelevant to their appropriate
 grade.
- DEPTH: How does your answer address the complexities in the question? How are you taking
 into account the problems in the question? Is that dealing with the most significant factors? A
 statement can be clear, accurate, precise, and relevant, but superficial (that is, lack depth). For
 example, the statement, "Just say No!" which is often used to discourage drug usage, is clear,
 accurate, precise, and relevant. Nevertheless, it lacks depth because it treats an extremely
 complex issue, the pervasive problem of drug use among young people, superficially. It fails to
 deal with the complexities of the issue.
- BREADTH: Do we need to consider another point of view? Is there another way to look at this
 question? What would this look like from a soldiers standpoint? What would this look like from
 the point of view of ...? A line of reasoning may be clear accurate, precise, relevant, and
 deep, but lack breadth (as in an argument from either the soldier or officer standpoint; Arms
 Corps or Logistic Corps standpoint; Coalition or Enemy standpoint which gets deeply into an
 issue, but only recognises the insights of one side of the question.)
- LOGIC: Does this really make sense? Does that follow from what you said? How does that follow? But before you implied this, and now you are saying that; how can both be true? When we think, we bring a variety of thoughts together into some order. When the combination of thoughts is mutually supporting and makes sense in combination, the thinking is "logical." When the combination is not mutually supporting, is contradictory in some sense or does not "make sense," the combination is not logical.

Valuable Intellectual Traits

It is possible to develop as a skillful thinker, and yet not to develop as a *fair-minded* thinker. It is possible to learn to use your skills of mind in a narrow, self-serving way. Many highly skilled thinkers do just that, politicians, for example.

6

Egocentric thinking: Deal with your irrational mind. Egocentric thinking emerges from our innate human tendency to see the world from a narrow, self-serving perspective. We naturally think of the world in terms of how it can serve *us*. We naturally assume that our thinking is rational. No matter how irrational our thinking is, no matter how destructive, when we are operating from an egocentric perspective, we see our thinking as reasonable. Our thinking seems to us to be right, true, good, and justifiable. Our egocentric nature, therefore, creates the most formidable barrier to critical thinking. As humans we think; as *critical thinkers* we analyse our thinking. As humans we think egocentrically; as *critical*



thinkers we expose the egocentric roots of our thinking to close scrutiny. As humans we are governed by our thoughts; as *critical thinkers* we learn how to govern the thoughts that govern us.

Fair-mindedness: The best thinkers do not pursue selfish goals. They strive to be fair-minded, even when it means they may have to give something up in the process. They recognise that the mind is not naturally fair-minded, but selfish. And they recognise that to be fair-minded, they also must develop specific traits of mind – traits such as intellectual autonomy, intellectual humility, intellectual integrity, intellectual courage, intellectual empathy, intellectual perseverance, and confidence in reason. The traits of mind essential for critical thinking are interdependent. Having a consciousness of the need to treat all viewpoints alike, without reference to your own feelings or vested interests, or the feelings or vested interests of your friends, community or nation; implies adherence to intellectual standards without reference to your own advantage or the advantage of your group.

Intellectual Autonomy: Value independence of thought. Intellectual autonomy means thinking for yourself while adhering to standards of rationality. It means thinking through issues using your own thinking rather than uncritically accepting the viewpoints of others. Intellectually autonomous thinkers do not depend on others when deciding what to believe and what to reject. They are influenced by others' views only to the extent that those views are reasonable given the evidence. In forming beliefs, you should not passively accept the beliefs of others. Rather, you should think through situations and issues for yourself. You should reject unjustified authorities while recognising the contributions of reasonable authorities. Intellectual autonomy is difficult to develop because social institutions, like Army, depend heavily on passive acceptance of the status quo, whether intellectual, political or economic. Thinking for yourself may lead to unpopular conclusions that are not sanctioned by the powers that be, while there may seem to be rewards for those who simply conform in thought and action.

Intellectual Empathy: Learn to enter opposing views empathically. Having a consciousness of the need to put yourself in the place of others to genuinely understand them. It requires you to accurately reconstruct the viewpoints and reasoning of others and to reason from premises, assumptions, and ideas other than your own. This trait also requires the willingness to remember occasions when you were wrong in the past despite an intense conviction that you were right, and the ability to imagine being similarly deceived in a caseat-hand. If you do not learn how to take on others' perspectives and to accurately think as they think, you will not be able to fairly judge their ideas and beliefs.

Intellectual Empathy --Activity

 Think of an argument you've had with someone recently (friend, partner, supervisor, subordinate). Reconstruct the argument from your perspective as well as that of the other person. Take care not to distort the other person's viewpoint, even if it means you have to admit you were wrong. (Remember that critical thinkers want to see the truth in situations)
 My perspective was ... (state and elaborate in detail)
 The other person's view was ... (state and elaborate in detail)

Intellectual Humility: Strive to discover the extent of your ignorance. Having a consciousness of the limits of your own knowledge. including a sensitivity to circumstances in which your native egocentrism is likely to function selfdeceptively; sensitivity to bias, prejudice and limitations of your viewpoint. Intellectual humility depends on recognising that you should not claim more than you actually know. It does not imply spinelessness or submissiveness. It implies the lack of intellectual pretentiousness, boastfulness, or conceit, combined with insight into the logical foundations (or lack of such foundations) of your The opposite of intellectual humility is beliefs.



intellectual arrogance, which involves having little or no insight into self-deception or into the limitations of your point of view. This does not necessarily imply that you are outwardly smug or pompous, but rather intellectually you believe what does not make sense to believe and at the same time are fully confident in that belief (false beliefs, misconceptions, prejudices, illusions, myths, propaganda, and ignorance seem as unvamished truth and when challenged, you resist admitting that your thinking is flawed). Intellectual arrogance is incompatible with fair-mindedness because you cannot judge fairly when you are in a state of ignorance about that which you are judging. To improve your thinking, you must develop your ability to recognise the limitations of your knowledge and potential weaknesses in your thinking as a consequence of intellectual arrogance.

7

Intellectual Courage – The Emperor's New Clothes

Long ago there lived an Emperor who took great pride in his clothes. One day, two swindlers told him that they could make the finest suits from magnificent cloth that was so special that it was invisible to anyone who was either stupid or not fit for his position. The Emperor who was at first sceptical about this claim sent two of his trusted men to see the cloth. However, neither of them had the intellectual courage to admit that they could not see the cloth and so praised it. The Emperor then allowed himself to be dressed in the clothes for a procession, never admitting that he too was unable to see the clothes that he was wearing. The townspeople all praised the emperor's new clothes also afraid to admit they could not see them, until a small child demonstrated his intellectual courage and said:

'But he has nothing on!'

and uncritically "accept" what you have "learned." Intellectual courage comes into play here, because inevitably you will come to see some truth in some ideas considered dangerous and absurd, and distortion or falsity in some ideas strongly held in our social group. You need courage to be true to your own thinking in such circumstances. The penalties for non-conformity can be severe. Intellectual Courage: Develop the courage to challenge popular beliefs. Having a consciousness of the need to face and fairly address ideas, beliefs or viewpoints that you have strong negative emotions and have not given a serious hearing. This courage is connected with the recognition that ideas considered dangerous or absurd are sometimes rationally justified (in whole or in part) and that conclusions and beliefs inculcated in you are sometimes false or misleading. To determine for yourself which is which, you must not passively

Intellectual Courage – Activity

- Think of a circumstance in which either you or someone you know defended a view that was unpopular within the group. Describe the circumstance and how the group responded.
- Why was the view unpopular?
- » Was the view supported by evidence and reasoned argument?

Intellectual Integrity: Hold yourself to the same standards to which you hold others: Recognition of the need to be true to your own thinking; to be consistent in the intellectual standards you apply; to hold yourself to the same rigorous standards of evidence and proof to which you would hold your antagonists; to practice what you advocate for others; and to honestly admit discrepancies and inconsistencies in your own thought and action. Because of its innate need to project a positive image, the appearance of integrity is important to the egocentric mind. Therefore, you actively hide your hypocrisy from yourself.

Intellectual Perseverance: Refuse to give up easily; work your way through complexities and frustration. Having a consciousness of the need to use intellectual insights and truths in spite of difficulties, obstacles, and frustrations; firm adherence to rational principles despite the irrational opposition of others; a sense of the need to struggle with confusion and unsettled questions over an extended period of time to deeper understanding achieve or insight. Understanding the views of others requires intellectual work. It requires intellectual perseverance - insofar as those views differ from ours or are complex in nature. If you are unable or unwilling to work through the views of others,

Intellectual Integrity – Plagiarism or not

- You are one of several members on course. You've been issued with the 'greens' to undertake an individual Assessment using the Army IMAP. You have 8 hours to complete the assessment and hand it into the Duty Officer. You are approached by several course members suggesting that you meet up after dinner to discuss the assessment prior to its completion.
- What is your response? Elaborate and explain your response.

Intellectual Perseverance – Activity

- Consider a TEWT solution delivered by one of your soldiers that differs from your considered solution or that suggested by the 'pinks'.
 - . How do you respond to the soldier?
 - Do you question the soldier to test his/her reasoning process?
 - Do you persevere to understand the point of view put forward by the soldier?

to consider the information they use and how they interpret that information, to look closely at their beliefs, and analyse those beliefs for yourself, to understand what they are trying to accomplish and how they see the world, you will not be able to think fairly within their viewpoint.

Confidence in Reason: Respect evidence and reasoning, and value them as tools for discovering the truth. Confidence that, in the long run, your own higher interests and those of human kind at large will be best served by giving the freest play to reason, by encouraging people to come to their own conclusions by developing their own rational faculties; faith that, with proper encouragement and cultivation, people can learn to think for themselves, to form rational viewpoints, draw reasonable conclusions, think coherently and logically, persuade each other by

reason and become reasonable persons, despite the deep-seated obstacles in the native character of the human mind and in society as we know it. Few people have genuine confidence (or faith) in reason. Instead, they tend to have uncritical (or blind) faith in any of the following, based on irrational drives and emotions:

- Faith in charismatic national leaders (think of leaders able to excite millions of people and manipulate them into supporting unjust wars)
- · Faith in charismatic cult leaders
- Faith in the father as the traditional head of the family (as defined by

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Faith in Reason – Activity Think of a recent situation that you felt yourself being defending and you percenting that

- being defensive and you now realise that you were not able to listen to an argument that you did not agree with at the time, although the argument had marit. In this situation, you were not able to be moved by good reasons.
- Write what happened in the situation
- Write the reasonable arguments against your position that you were not willing to listen to at the time.
- $\underline{\mbox{\tiny \square}}$ What hindered you ability to consider good reason?

9

religious or social tradition)

- Faith in institutional authorities (police, social workers, judges, priests, etc)
- Faith in spiritual powers
- Faith in some social group, official or unofficial (gang, church, political party, business community groups)
- Faith in a political ideology
- Faith in one's unanalysed emotions
- Faith in one's gut impulses
- Faith in fate
- Fait in social or legal institutions (courts, schools, business community, government)
- Faith in the mores of a social group or culture
- Faith in people with social status or position
- Faith in one's own unanalysed experience (faith in the idea that one's interpretations about
 past experiences are the only right and true way to interpret those experiences (Vietnam
 War decisions)

CRITICAL THINKING TOOLS

Core Critical Thinking Skills

There are six core critical thinking skills. These are detailed below with examples of their use:

Interpretation to comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgements, conventions, beliefs, rules, procedures, or criteria. Examples include:

- recognising a problem and describing it without bias;
- reading a person's intentions in the expression on his/her face;
- distinguishing a main idea from subordinate ideas in a text;
- constructing a way of organising something you are studying;
- paraphrasing someone's ideas in your own words;
- clarifying what a sign, chart or graph means; and
- identifying an author's purpose, theme or point of view.

Analysis to identify the intended and actual inferential relationship amongst statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgement, experiences, reasons, information or opinions. Examples include:

- identifying the similarities and differences between two approaches to the solution of a given problem;
- identifying the main claim made in a newspaper editorial and tracing back the various reasons the editor offers in support of that claim;
- identifying unstated assumptions;
- constructing a way to represent a main conclusion and the various reasons given to support or criticise it;
- sketching the relationship of sentences or paragraphs to each other and to the main purpose
 of the passage; and
- graphically organising written work in your own way, knowing that its purpose is to give an
 overview of information.

Evaluation to assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgement, belief or opinion and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions or other forms of representation. Examples include:

- comparing the strengths and weaknesses of alternative interpretations;
- determining the credibility of a source of information;

- judging if two statements contradict each other;
- judging if the evidence at hand supports the conclusion being drawn;
- judging if an argument's conclusion follows either with certainty or with a high level of confidence from its premises; and
- judging the logical strengths of arguments based on hypothetical situations.

Inference to identify and secure elements needed to draw reasonable conclusions, to form conjectures and hypotheses, to consider relevant information and to educe the consequences flowing from data, statements, principles, evidence, judgements, beliefs, opinions, concepts, descriptions, questions or other forms of representation. Examples include:

- drawing out or constructing meaning from the elements in a reading;
- identifying and securing the information needed to formulate a synthesis from multiple sources; and
- when faced with a problem, developing a set of options for addressing it.

Explanation to state the results of one's reasoning; to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments. Examples include:

- to construct a chart which organises one's findings;
- to write down for future reference your current thinking on some important and complex matter;
- to site the standards and contextual factors used to judge the quality of an interpretation of a text;
- to state research results and describe the methods and criteria used to achieve those results;
- to appeal to established criteria as a way of showing the reasonableness of a given judgement;
- to design a graphic display which accurately represents the subordinate and super-ordinate relationship among concepts or ideas; and
- to site the evidence that led you to accept or reject an author's position on an issue.

Self-regulation to self-consciously monitor one's cognitive activities, the elements used in those activities and the results educed, particularly by applying skills in analysis, and evaluation to one's own inferential judgements with a view towards questioning, confirming, validation, or correcting either one's reasoning or one's results. Examples include:

- to examine your views on a controversial issue with sensitivity to the possible influences on your personal biases or self-interest;
- to monitor how well you seem to be comprehending something;
- to separate your personal opinions and assumptions from those of the author of a passage or text;
- to double check yourself by recalculating the figures;
- to vary your reading speed and method according to the type of material and one's purpose for reading;
- to reconsider your interpretation or judgement in view of further analysis of the facts of the case;
- to revise your answers in view of the errors you discovered in your work; and
- to change your conclusion in view of the realisation that you had misjudged the importance of certain factors when coming to your earlier decision.

Disposition of Critical Thinkers

There are several intellectual traits displayed by critical thinkers, which can be grouped into seven broad thinking dispositions characterised as a triad of inclinations, sensitivities and abilities.

The intellectual traits of critical thinkers include:

- Inquisitiveness with regard to a wide range of issues;
- Concern to become and remain well-informed;
- Alertness to opportunities to use critical thinking;
- Trust in the processes of reasoned inquiry;
- Self-confidence in one's own abilities to reason;
- Open-mindedness regarding divergent world views;
- Flexibility in considering alternatives and opinions;
- Understanding of the opinions of other people;
- Fair-mindedness in appraising reasoning;
- Honesty in facing one's own biases, prejudices, stereotypes, or egocentric tendencies;
- Prudence in suspending, making or altering judgments;
- Willingness to reconsider and revise views where honest reflection suggests that change is warranted;
- Clarity in stating questions/concerns;
- Orderliness in working with complexity;
- Diligence in seeking relevant information;
- Reasonableness in selecting and applying criteria;
- Care in focusing attention on the concern at hand;
- · Persistence through difficulties when encountered; and
- Precision to the degree permitted by the subject and the circumstances.

The following table provides a description of seven dispositions characterised as a triad of inclinations, sensitivities, and abilities.

Thinking Dispositions	Key Inclinations	Key Sensitivities	Key Abilities	
The disposition to be broad and adventurous	The tendency to be open-minded and to look beyond what is given; the impulse to probe assumptions and examine alternative points of view; the desire to tinker with boundaries and play with new ideas; the urge to speculate, generate many options, and explore multiple interpretations	An alertness to binariness, dogmatism, sweeping generalities, narrow thinking, parochialism, and occasions when alternative perspectives are neglected	The ability to identify assumptions, to look at things from other points of view, to generate and review multiple options; brainstorming; empathic thinking; flexible thinking	
The disposition toward sustained intellectual curiosity	A zest for inquiry; the urge to find and pose problems; the tendency to wonder, question, probe	An alertness to unasked questions, anomalies, hidden facets; detection of gaps in one's knowledge or understanding; noticing what is unknown or unclear	The ability to observe closely, to identify and challenge assumptions, to formulate and investigate provocative questions, to focus and persist in a line of inquiry	

Thinking Dispositions	Key Inclinations	Key Sensitivities	Key Abilities
The disposition to clarify and seek understanding	A desire to apprehend things clearly; the impulse to anchor ideas to experience and seek connections to prior knowledge; an urge to sharpen conceptions and examples; a desire to grasp the essence of things	Alertness to unclarity and discomfort with vagueness; alertness to superficiality; detection of occasions needing a sharper focus; a leaning towards hard questions	The ability to ask pointed questions and to build complex conceptualizations; the ability to apply and exemplify ideas, to make analogies and comparisons, to identify and classify details
The disposition to be planful and strategic	The urge to set goals and to make and execute plans; the tendency to approach things in a calculated and/or stepwise fashion; a desire to think ahead.	Alertness to aimlessness, lack of direction, lack of orientation; alertness to off-hand thinking and sprawling thinking	The ability to formulate goals and to evaluate alternative modes of approach; the ability to make and execute plans and to forecast possible outcomes
The disposition to be intellectually careful	The urge for precision; a hunger for mental orderliness and organization; a desire to be thorough	Alertness to the possibility of error, to disorder and disorganization; awareness of the abiding potential for inaccuracy and inconsistency.	The ability to process information precisely, to recognize and apply intellectual standards, to construct order out of disarray
The disposition to seek and evaluate reasons	A leaning towards healthy skepticism; the tendency to question the given, to probe assumptions and biases; the drive to pursue and demand justification; the urge to discover underlying grounds and sources.	an alertness to evidential foundations; a responsiveness to superficiality and over- generalization, a wariness of gaps in knowledge.	The ability to distinguish cause and effect, the ability to identify logical structure; the ability to reason inductively, the ability to weigh and assess reasons
The disposition to be metacognitive	The urge to be cognitively self-aware and to monitor the flow of one's thinking; the impulse to stand back and take stock; the desire to be self- challenging	Alertness to loss of control of one's thinking; detection of complex thinking situations requiring self-monitoring; recognition of the need to look back on a thinking episode	The ability exercise executive control of mental processes, to conceive of the mind as active and interpretive, to be self- evaluative, and to reflect on prior thinking.

Key Dispositions for Good Thinking - Perkins, Jay & Tishman

14

CLASSROOM APPLICATIONS



As an instructor, you must keep reminding yourself that for substantive learning to take place, students must continually apply all the cognitive skills, abilities and dispositions associated with thinking. They must practice by:

- Writing
- Reading
- Hearing
- Saying
- Applying

These are the fundamental LLN skills that should be inherent in every lesson. They are the fundamental thinking and communication skills required by every soldier.



Write

Read

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Thinking Curricula

You must develop your curriculum so that:

- Students can actively create their own knowledge of interpretation frameworks;
- Students are taught explicitly how to think through content;
- Student must be given time and opportunity to talk about and evaluate their own and other's thinking processes.





Critical thinking is that mode of thinking - about any subject, content, or problem - that the thinker improves the quality of his/her thinking by skilfully **analysing**, **assessing**, and **reconstructing** it fair-mindedly.

What follows are strategies of how to achieve a thinking curriculum.



Soldiers must be taught explicitly how to think

- Teach soldiers how to assess their writing
- Teach soldiers how to assess their reading
- Teach soldiers how to assess their speaking
- Teach soldiers how to assess their listening
- Cultivate important intellectual traits in instruction
 - Critical conversation protocol
 - Model skilled thinking for your soldiers out loud

Soldiers must talk and reflect about their thinking

- Encourage students to think about their thinking meta-cognitive approach
 - Structured silence
 - Intellectual journal/self-reflection
 Brainstorming
 - Practice using SEE construct, State, Elaborate and give Example of concepts (ideas)
- Expose students to other points of view
 - Role play other points of view
 - Critical debate
- Require reflection time with specific reflective activities as part of the curriculum
 Critical incident questionnaire
- Reduce Curriculum Coverage and redesign lessons based on critical thinking concepts and tools
 - a critical thinking outcomes

In order to comply with TC-A policy, all Instructors are to incorporate critical thinking learning strategies into their lessons in order to maximise the potential of trainees to develop effective critical thinking skills. The following strategies have been developed to provide practical examples of how, during either whole-class or syndicate theory lessons, trainees can become actively engaged in their learning. These strategies cater for the needs of adult learners and are varied to accommodate a range of subject areas. If instructors are aware of other teaching strategies that achieve critical thinking outcomes, these may also be applied.

Remember — good teaching = whatever helps soldiers learn!

What is distinctive about Adult Learners?

When planning lessons, consider that adults create their own content interpretation frameworks, ie:

- Adult learners are self-motivated—they bring a clear sense of why they are participating in learning.
- Adult learners desire to see the immediate application (purpose) of learning to their goals or problems.
- Adult learners want their own experiences acknowledged and brought into the curriculum.
- Adult learners constantly try to connect new learning to existing/previous experiences.
- · Adult learners prefer to learn in self-directed ways-ie to be intellectually engaged.

A Thinking Curriculum

The following strategies will assist trainees to create their own content interpretation frameworks, to think critically and to reflect about their thinking:

- Analyse the logic of the content at hand (logic of subjects, logic of articles/ text books/ chapter/ doctrine/ problems)
- Discussion Inventory
- Structured Silence
- Critical Debate
- Jigsaw Technique
- Rotating Stations
- Newsprint Dialogues
- Explicitly teach soldiers how to assess their
 - o Writing
 - o Reading
 - o Speaking
 - o listening
- Critical Conversation Protocol
- Model Skilled Thinking out loud in class
- Intellectual Journal/self-reflection
- Brainstorming
- Practice using State, Elaborate, Example the (SEE) construct
- Role Playing
- Critical Debate
- Critical Incident Questionnaire
- Apply Socratic Questioning Techniques
- Circular Response Discussions



SMALL GROUP ACTIVITIES

The CTCT Model can be used in all learning situations. All content represents a distinctive mode of thinking. For example tactics becomes easier as you learn to think tactically; logistics becomes easier as you learn to think logistically; military history becomes easier as you learn to think like a military historian, leadership becomes easier as you learn to think like a leader, instructing becomes easier as you learn to think like a teacher, and so on.

The spirit of critical thinking is that there is a logic to x, and I can figure it out.

Learning Situations

- Analysing Problems Tactical, Logistical (Critical Reasoning is a way of thinking through the MAP)
- Analysing the logic of essays (starting with sentences – then paragraphs – then essays)
- Analysing the logic of doctrine content
- Analysing the logic of history articles
- Analysing the logic of textbooks/policy/doctrine
- Analysing the logic of subjects/disciplines
- Used in Close Reading activities
- Used to produce Substantive Writing

Critical thinkers have confidence in their

ability to figure out the logic of anything they choose. They continually look for order, system and interrelationships.

Analysing the Logic of a subject/course

When you understand the elements of reasoning, you realise that all subjects, all disciplines, have a fundamental logic defined by the structures of thought embedded in them.

To analyse the fundamental logic of a subject, you should begin with these questions:

- What is the main purpose or goal of studying this subject? What are people in this field trying to accomplish?
- . What kinds of questions do they ask? What kinds of problems do they try to solve?
- · What sorts of information or data do they gather?
- What types of inferences or judgements do they typically make? (Judgements about ...)
- · How do they go about gathering information in ways that are distinctive to this field?
- · What are the most basic ideas, concepts or theories in this field?
- What do professionals in this field take for granted or assume?
- How should studying this field affect my view of the world?
- · What viewpoint is fostered in this field?
- What implications follow from studying this discipline? How are the products of this field used in the workplace?

These questions can be contextualised for any given class day, chapter in doctrine/text, and dimension of study. For example, on any given day, you as an instructor might ask:

- · What is our main purpose or goal today? What are we trying to accomplish?
- What kinds of questions are we asking? What kinds of problems are we trying to solve? How does this problem relate to the workplace?
- . What sort of information or data do we need? How can we get that information?
- What is the most basic idea, concept or theory we need to understand to solve the problem we are most immediately posing?
- From what point of view should we look at this problem?
- What can we safely assume as we reason through this problem?
- Should we call into question any of the inferences that have been made?
- What are the implications of what we are studying?



Example: The Logic of Military History







Using this concept in lesson planning

Once you have introduced the critical thinking foundational concepts to trainees, they will be able to appreciate the use of the logic wheel for any content that you teach. It may be a good way of assisting trainees to contextualise their purpose for learning any new content, in this case, the TRF. It helps them to build on their knowledge frameworks.

You are now in a position to have trainees undertake a syndicate activity where they must role play the TRF requirements for a SQN Tech Cpl for example. They could be issued with the relevant documents (MMP for example) and set a task like: You are the SQN Tech CPL, please present me with a COA to carry out your TRF responsibilities for B Vehicles.

I would expect the CPL to be able to use the elements of reason and the intellectual standards to develop a suitable COA. The outputs could be presented to the whole group and feedback provided as suitable by peers and facilitator.

Analysing the Logic of an Article, Essay, Chapter, Text

One important way to understand an essay, article, or chapter is to analyse the parts of the author's reasoning and then evaluate the author's reasoning using the intellectual standards.

(1) To analyse the parts of the author's reasoning:

- The main **purpose** of this article is (Here you are trying to state, as accurately as possible, the author's intent in writing the article. What was the author trying to accomplish?)
- 3. The most important information in this article is (You want to identify the key information the author used, or presupposed, in the article to support his/her main arguments. Here you are looking for facts, experiences, and data the author is using to support his/her conclusions.)
- 4. The main **inferences** in this article are (You want to identify the most important conclusions the author comes to and presents in the article).
- 5. The key concept(s) we need to understand in this article is (are) By these concepts the author means (To identify these ideas, ask yourself: What are the most important ideas that you would have to know to understand the author's line of reasoning? Then briefly elaborate what the author means by these ideas.)

- (2) To evaluate the author's reasoning:

- Identify the author's purpose: Is the purpose of the author well-stated or clearly implied? Is it justifiable?
- 2. Identify the key question which the written piece answers: Is the question at issue wellstated (or clearly implied)? Is it clear and unbiased? Does the expression of the question do justice to the complexity of the matter at issue? Are the question and purpose directly relevant to each other?
- 3. Identify the most important information presented by the author: Does the writer cite relevant evidence, experiences, and /or information essential to the issue? Is the information accurate and directly relevant to the question at issue? Does the writer address the complexities of the issue?
- 4. Identify the most fundamental concepts which are at the heart of the author's reasoning: Does the writer clarify key ideas when necessary? Are the ideas used justifiably?
- 5. Identify the author's assumptions: Does the writer show a sensitivity to what he/she is taking for granted or assuming (insofar as those assumptions might reasonably be questioned)? Or does the writer use questionable assumptions without addressing problems inherent in those assumptions?
- 6. Identify the most important inferences or conclusions in the written piece: Do the inferences and conclusions made by the author clearly follow from the information relevant to the issue, or does the author jump to unjustifiable conclusions? Does the author consider alternative conclusions where the issue is complex? In other words, does the author use a sound line of reasoning to come to logical conclusions, or can you identify flaws in the reasoning somewhere?
- 7. Identify the author's point of view: Does the author show a sensitivity to alternative relevant points of view or lines of reasoning? Does he or she consider and respond to objections framed from other relevant points of view?
- 8. Identify implications: Does the writer display a sensitivity to the implications and consequences of the position he/she is taking?

Discussion Inventory

This is a useful strategy to use during Syndicate Discussions.

At the start of the lesson, tell trainees that for the last 5–10 mins, you (facilitator) will provide some of your own reflections on the discussion. A *Discussion Inventory* is a list of the things you want to make sure trainees are exposed to by the end of the lesson. Essentially, it is blank at the start of the syndicate discussions but fills up as you jot down errors you hear, perspectives that you feel are glossed over or ignored, and important oppositional views that you think are too easily rushed past.

In the 5–10-min inventory time, you provide information about perspectives that were missed during the discussion and offer alternative interpretations that trainees may not have considered. This is also an excellent time to draw trainees' attention to what you consider to be major errors of understanding you have noticed being expressed during the conversation. Sometimes, in the middle of a discussion that is going well, someone will make a statement that you know shows a complete misunderstanding of a concept or is clearly factually wrong, but rather than interrupting the flow of talk at that particular time or single out that contributor, you jot down a note on your inventory pad to make sure you address it in the time reserved at the end of the lesson. Thus, the discussion inventory allows you to correct mistakes and to tackle repressive tolerance by making sure participants do not leave without being exposed to a perspective you feel it is necessary for them to encounter.

Teach trainees how to assess their reading

In a well-designed class, trainees typically engage in a great deal of reading. Hence, it is important that they learn to 'figure out' the logic of what they are reading (the logically interconnected meanings). Good reading is a dialogue between the reader and the text. The writer has chosen words to convey his/her thoughts and experiences. The reader must translate from those words Guidelines on Critical Thinking Concepts and Tools – Version 2.0 dated 7 Jun 07 by LTCOL Deb Bradford

back into his/her own thoughts and experiences and, therefore, capture the meaning of the author. This is a complex process. One method is as follows:

Place trainees into groups of three (Person A, B and C). Read a paragraph or two from text aloud, slowly, commenting on what you are reading as you are reading, explaining what is making immediate sense to you and what you need to figure out by further reading.

After modelling in this manner for a couple of paragraphs, you ask A to take over and read aloud to B and C, explaining to them, sentence by sentence, what he/she is able to figure out and what he/she is not. After A is finished with two paragraphs, B and C then comment on what they do and do not understand (in the paragraphs that A read). Following this, you read the two paragraphs that A read aloud to the whole class, commenting as you go. Then, B takes over and reads the next two paragraphs to A and C who then add their thoughts. Next, you read aloud what B reads. You then go on to C who reads the next two paragraphs to A and B. And so on.

As the trainees are reading in their groups of three, you are circulating around the room listening in and getting an idea of the level of proficiency of their critical reading. The more you use this process, the better trainees become at critical reading. When they become proficient at it, they begin to ask questions in their own minds as they read, clarifying as they read, questioning what they do not understand. (The art of close reading)

Teach trainees how to assess their writing

Good thinking is thinking that (effectively) assesses itself. As a critical thinker, I do not simply state the problem; I assess the clarity of my own statement. I do not simply gather information; I check it for its relevance and significance. I do not simply form an interpretation; I check to make sure my interpretation has adequate evidentiary support. Due to the importance of self-assessment to critical thinking, it is important to bring it into the structural design of the curriculum and not just leave it to random or chance use.

The art of Substantive Writing. Here are a variety of strategies that can be used for fostering self-assessment through peer-assessment when trainees are required to bring written work to class:

Working in groups of four, trainees choose the best paper (using the intellectual standards as well as any other standards you have provided). They then join with a second group and choose the best paper of the two (one from each group). These papers (chosen by the 8-person group) are collected and read to the class as a whole. A class-wide discussion is held, under your direction, to make clear the strengths and weaknesses of the competing remaining papers, leading to the class voting on the best paper of the day (again always using explicit intellectual standards in each assessment).

Working in groups of three or four, trainees write out their recommendations for improvement on three or four papers (from trainees not in the group). The written recommendations go back to the original writers who do a revised draft for the next class. Using this method every trainee receives written feedback on their papers from a 'team' of critics.

Working in groups of three or four, trainees take turns reading their papers aloud slowly and discussing the extent to which they have or have not fulfilled the performance criteria relevant to the paper.

One trainee's paper is read aloud slowly to the class while the instructor leads a class-wide discussion on how the paper might be improved. This discussion serves as a model of what is expected in the assessment process. The trainees then work in groups of two or three to try to come up with recommendations for improvement for the trainees in their group (based on the model established by the instructor).

Teach the trainees how to assess their speaking

In a well-designed class, trainees often engage in oral communication. They articulate what they are learning: explaining, giving examples, posing problems, interpreting information, tracing assumptions and so on. They learn to assess what they are saying, becoming aware of when they are being vague, when they need an example, when their explanations are inadequate and so on. Here are three general strategies you can use to teach trainees to assess their speaking abilities:

Trainees teaching other trainees. One of the best ways to learn is to try to teach someone else. If we have trouble explaining something, it is often because we are not clear about what we are explaining.

Group problem solving. By putting trainees in a group and giving them a problem or issue to work on together, their mutual articulation and exchanges will often help them to think better. They often help correct each other, and so learn to 'correct' themselves. Make sure that they are routinely applying intellectual standards to their thinking as they discuss issues.

Oral test on basic vocabulary. One complex tactic that aids trainee learning is the oral test. Trainees are given a vocabulary list. They spend time studying the key concepts for the course. They are then put into groups of twos or threes and are asked to take turns explaining the concepts to each other. They are encouraged to assess each other's explanations. Wander about the class listening in and choose two trainees who seem prepared for the oral exam. Stop the class and announce that the oral test is going to begin and that you have chosen 'X' and 'Y' to be tested first. After you test these two trainees (and they pass), announce to the class that X and Y have passed, and they are now 'certified' to test others. However, anyone 'certified' by a trainee tester must be 'spot-tested' by you on one item. If any such trainee fails your spot test, the person who certified them is 'decertified' (and must repeat the exam). Everyone who passes becomes a certifier and gets paired with a trainee who has not taken the test. By this method, you only test the first two trainees. For the rest of the process, you direct 'traffic' and spot-check those who are 'certified' by a peer. During this assessment, the tester should be looking for a beginning understanding of the concepts, and the ability to give examples of the concept. Since the trainees who pass become 'certifiers' or 'tutors' and are assigned to assess other trainees (or tutor them), everyone gets multiple experiences explaining, and hearing explanations of, the basic vocabulary (of your content). We give a vocabulary list to the trainees on the first day of class so they know exactly which concepts they will be expected to explain during the oral exam. We give this exam during the first few weeks of class so trainees learn the most basic vocabulary early in the curriculum, vocabulary that is then used on a daily basis in class. You might want to modify this exam by giving parts of it during or after each module.

Teach trainees how to assess their listening

Since trainees spend a good deal of their time listening, and since developing critical listening skills is difficult to achieve, it is imperative that instructors design lessons that foster critical listening. This is best done by holding trainees responsible for their 'listening' in the classroom. Here are some structures that help trainees develop critical listening abilities:

Call on trainees regularly and unpredictably, holding them responsible either to ask questions they are formulating as they think through the content or give a summary, elaborating or example of what others have said.

Ask every trainee to write down the most basic question they need answered in order to understand the issue or topic under discussion:

collect the questions (to see what they do/don't understand) and use to plan next lesson or to direct next part of same lesson; OR

23

call on some of them to read their questions aloud (facilitate others to answer the questions if possible before you provide clarity...); OR

in groups of two, each person tries to answer the question of the other.

Critical Debate

Trainees are asked to explore an idea or take a position that they find unfamiliar, unsympathetic or even objectionable. They do this as members of a debate team.

Prepare the debate. Find a contentious issue on which opinion is divided amongst participants. Frame the issue as a debate motion.

Propose the motion to participants. Ask people to volunteer by a show of hands to work on a team that is preparing arguments to support the motion, or one that is preparing arguments to oppose it.

Announce that all those who have volunteered to work on the team to draft arguments to support the motion will now comprise the team to draft arguments which oppose it. Similarly, all those who have offered to work on the team to draft arguments to oppose the motion will now comprise the team to draft arguments that support it. Allow time for the preparation of a response. Trainees may require access to references or a précis, depending on the subject of the motion.

Conduct the debate. Each team chooses one person to present their arguments. After initial presentations the teams reconvene to draft rebuttal arguments. A different person presents these.

Debrief the debate. Discuss with participants their experience of this exercise. Focus on how it felt to argue against positions to which they were committed. What new ways of thinking about the issue were opened up? Did participants come to new understandings? Did they change their positions on the issue at all?

Ask participants to write a follow up reflection paper on the debate. Trainees should address the following questions:

What assumptions about the issue were clarified or confirmed for you by the debate?

Which of these assumptions were you surprised by during the debate? Were you made aware of assumptions that you didn't know you held?

How could you check out these new assumptions?

What sources of evidence would you consult?

What new perspectives (points of view) on the issue suggested themselves to you?

In what ways, if any, were your existing assumptions challenged or changed?

Critical conversation protocol

A critical conversation is a focused conversation in which someone is helped:

to come to an awareness of the assumptions she is operating under;

to investigate whether these assumptions are well-grounded;

24

to look at her practice from different viewpoints;

to think about the implications of the conversation for the future.

In a process of structured critical conversation, trainees play one of three roles—storyteller, detective or umpire. The storyteller is the person who is the focus of the critical conversation. He/she gives a verbal solution to some problem, scenario or work experience. The detectives are the group who help the storyteller come to a more fully informed understanding of the assumptions and actions that frame his/her practice or experience. The umpire is the group member who has agreed to monitor the conversation with a view to pointing out when people are talking to each other in a judgmental way. All participants in the group play all three of these roles at different times. During each iteration of the exercise, the roles change. Although this is a heavily structured exercise, the intent is for these dispositions to become so internalised that the ground rules and structure outlined become unnecessary. The idea is that the behaviours with each role gradually become habitual. (critical dispositions)

The storyteller (10 mins). The conversation opens with the storyteller describing in detail the situation and his/her proposed solution without any questions or interruptions. Meanwhile, the detectives listen with a purpose. They try to determine the storyteller's logic of thought (elements of reason) and take notes.

The detectives (10 mins). The detectives are allowed to break their silence to ask questions, searching for information that will complete the logic of thought as they have heard it. One ground rule they must observe is that of requesting information, not giving judgement. Their questions are asked only for the purpose of evaluating the logic of thought (intellectual standards). They must refrain from giving their opinions or suggestions, no matter how helpful they feel these might be. Detectives should ask only one question at a time. They should not give advice on how the storyteller should have acted/solved the problem. Keep laughter to a minimum, for you do not know how it is received. The storyteller should answer questions as fully and honestly as possible and may ask the detectives why they asked that particular question.

The umpire. The umpire points out to the detectives any examples of judgemental questions they ask, particularly those in which they imply that they have seen a better way to respond to the situation. The umpire brings the detectives' attention to the ways in which their tone of voice and body language, as well as their words, risk driving the storyteller into a 'defensive bunker'.

The report—the story teller's assumptions. The detectives report the assumptions they hear in the storyteller's description (10 mins). When the situation has been fully described and all the detectives' questions have been answered, the conversation moves to the assumption hunting phase. Here, the detectives tell the storyteller, on the basis of his/her story and his/her response to their questions, what assumptions they think she/he holds. This is done as non-judgementally as possible, as a reporting back brief. The detectives seek only to state clearly what they think the storyteller's assumptions are, not to judge whether they are right or wrong. They are asked to state these assumptions tentatively, descriptively and non-judgementally, using phrases like the following:

'It seems as if ... '

'I wonder if one assumption you might be holding is that...' or

'Is it possible that you assumed that ...?'

The umpire intervenes to point out to detectives when they are reporting assumptions with a judgemental overlay.

The alternate version—the detectives' interpretation. The detectives give alternative interpretations for the events described (10 mins). The detectives now give alternative versions of the events that have been described, based on their attempts to re-live the story through the points of view (eyes) of the other participants involved. These alternative interpretations must be plausible in that they are consistent with the facts as they have been described by the storyteller. The detectives are to give these interpretations as descriptions not judgements. They are describing how others involved in the events might have viewed them, not saying whether or not these perceptions are accurate. They should not give any advice here. As the storyteller hears these alternative interpretations, he/she is asked to let the detectives have the floor so that they can state their case as fully as possible. After they have described how the situation might look through the eyes of other participants, the storyteller is then allowed to give any additional information that would cast doubt on these interpretations. He/she is also allowed to ask the detectives to elaborate on any confusing aspects of why they are making the interpretations they are. At no time is he/she expected to agree with the detectives.

The review—all participants. (10 mins) The storyteller and detectives state what they have learned, what insights they have realised, and what their reflection means for their future actions. Now the detectives can give whatever advice they wish. The umpire gives an overall summary of the ability of participants to be respectful listeners and talkers, and also gives his/her perspective on the story.

WHOLE-CLASS ACTIVITIES—WORKING IN SMALL GROUPS

The Jigsaw Technique

This is a useful strategy for learning content from a text (doctrine, policy or other). It retains the advantage of small group discussion but infuses them with more diverse perspectives by using the cooperative grouping technique called 'jigsaw'.

Firstly, gather a short list of topics for study. Each trainee becomes an 'expert' on one of those topics, first by themselves and then in discussion with other experts. Later, these trainee experts become responsible, through dialogue, for helping non-experts to become as knowledgeable as they are. The sequence of steps is:

For a class of 36, allocate 6 topics (the number of topics should roughly equal the square root of the number of trainees in the class—8 in a class of 64 etc).

Each trainee is allocated a topic (evenly divided across the class). Time is spent before class studying the topic in order to develop the required expertise.

When class meets, trainees break into syndicate groups **based on their topic** (all like topics together)—trainees raise questions, explore misunderstandings and discuss what they have learned.

Once pooling of insights has finished, new small groups are formed that include expert representatives for each of the original topics.

Each trainee expert takes a turn to lead the others in a discussion of their particular area of expertise—these small groups end when all members of the group express satisfaction with their knowledge and understanding of all of the topics covered.

Sometimes the exercise ends there, other times it extends to a large group summing up.

Rotating Stations

Another way to avoid the usual format of reporting back through a series of summaries is to locate each small group in a syndicate room where they are given 5–10 mins to discuss an issue and record their ideas on butcher's paper or white boards.

When the time is up, the groups move to a new syndicate room where they continue their discussion. However, now, the comments written on the newsprint or white board by the preceding group add a new point of view (voice) to the mix. Rotations continue every 5–10 mins until each group has been at all of the positions and has had a chance to consider all of the other groups' comments.

Rotating stations encourages trainees to examine critically ideas that originate outside their group. The diversity of viewpoints experienced in whole class discussion is incorporated while maintaining the intimacy of small groups. Momentum and excitement tend to grow as groups rotate from one station to another. To increase the level of depth to the discussion, increase the amount of time before rotations.

Here are the instructions to trainees:

Each of you should join a group and assemble in syndicate rooms 1– #. Together, you will have the responsibility of answering some questions by making comments on the whiteboard (or butcher's paper). You will have 10 mins to do this. When the 10 mins is up, move in your group to a new station where you will continue your conversation by responding to the comments left behind by the group that has just vacated. Record the main points of your discussion at this station. After another 10 mins, rotate to the next syndicate room, where you now have the comments of two other groups to consider. Again, take 10 mins to respond, and then move when the 10 mins are up. When every group has completed each station, leaving remarks behind at all of them, break out of your groups and read all of the comments. Add questions, comments or criticisms to those wherever you are inspired to do so.

Remember that each station will include comments from all groups, making orderliness a challenge. Write as small and as legibly as you can, please!

Newsprint Dialogues

Small groups summarise their discussions on large sheets of newsprint (butcher's paper) or white boards. Individual members are then free to wander about the room reading all the responses and adding comments. Instructions are:

You will have 30 mins to discuss a series of questions and write your answers to them on the newsprint (white board). You should appoint a scribe but do not start writing immediately. Take some time to let your responses emerge from the discussion.

When your 30 mins is up, post your newsprint sheets, and tour the answers recorded by other groups. Look especially for common themes that stand out and for possible contradictions that arise within or between groups' responses. Write down your responses to others' comments on the same sheet of newsprint containing the point you're addressing.

Finally, note any questions that were raised for you during the discussion, on sheets especially provided for this.

The activity will close with a short debriefing in the large group.

Circular Response Discussions

The circular response exercise is a way to democratise discussion participation, to promote continuity and to give people some experience of the effort required in respectful listening. In this process, participants sit in a circle so that everyone can see each other, and each person in turn takes up to a minute to talk about an issue or question that the group has agreed to discuss. Speakers are not free, however, to say anything they want. They must incorporate into their remarks some reference to the preceding speaker's message and then use this as a springboard for their own comments. This does not have to be an agreement—it can be an expression of dissent from the previous opinion. The important thing is that the previous person's comments are the prompt for whatever is being said in circular response. What speakers articulate depends on listening well to the preceding speaker as much as on generating new or unspoken ideas. Participants are also asked if at all possible to point out anything the previous speaker said that was particularly interesting, resonating or important. The optimal size for this exercise is 6-8 participants. Here are the instructions:

Choose a theme that the group will discuss. Form into a circle and ask for a volunteer to start the discussion. This person speaks up to a minute or so about the theme chosen. After the minute is up, the first discussant yields the floor, and the person sitting to the discussant's left speaks for a minute or so. The second discussant must show in his/her contribution how what he/she is saying springs from, or is in response to, the comments of the first discussant. After a minute or so, the second discussant stops speaking, and the person to his/her left becomes the third discussant, and the discussion moves all the way around the circle. To sum up:

No one may be interrupted while speaking.

No one may speak out of turn in the circle.

Each person is allowed only a minute or so to speak.

Each person, in all comments, must strive to show how his/her remarks spring from, or respond to, the comments of the previous discussant.

Each person should try to show appreciation for something the previous speaker raised.

After each discussant has had a turn to speak, the floor is opened for general conversation, and the previous ground rules are no longer in force.

WHOLE-CLASS ACTIVITIES

Critical incident questionnaire (CIQ)

The best teaching is critically reflective; thus, try applying a critical incident questionnaire towards the end of a series of lessons.

Instructions. Take about five minutes to respond to each of the questions below about this week's classes. Do not put your name on the form. At the start of next week's class, I'll share the group's responses with you all. The aim is to help make the classes more responsive to your needs as a learner.

At what moment in class this week did you feel most engaged with what was happening?

At what moment in class this week did you feel most distanced from what was happening?

What action that anyone (instructor or trainee) took this week did you find most affirming or helpful?

What action that anyone (instructor or trainee) took in class this week did you find most puzzling or confusing?

What about the class this week surprised you the most? (This could be something about your own reactions to what went on, or something someone did, or anything else that occurs to you).

Structured Silence

This is a useful strategy for lecture style lessons.

Every 15–20 mins stop the lesson and call for a period of intentional structured silence of 2–5 mins. During a reflective pause, ask trainees to think quietly about ONE of the following questions (you choose which one depending on where the lesson has gone at that stage):

What was the most important point made in the last 15 mins?

What was the most puzzling or confusing point made in the last 15 mins?

What new information or new ideas did you learn about in the last 15 mins?

What assumptions you hold about the topic were confirmed in the last 15 mins?

Trainees should make notes in response to the question on 3 x 5 cards. Once finished, they should be handed to the front and shuffled. Randomly read out several of the cards to help structure the next 15 mins of lesson discussion. It gives you a sense of what meanings trainees are creating about the current lesson topics.

QUICK WHOLE-CLASS LESSON ACTIVITIES

Methods

- individual writing for personal reflection (using a directed reflection activity)
- individual writing—instructor elicits a response—then elicits feedback (agreement or disagreement) from other trainees
- individual writing-then share with a partner who provides feedback
- individual reflection—then discussion with a partner—partners come to an agreement
- individual reflection—then discussion with a partner—partners come to an agreement instructor elicits a response—then instructor elicits feedback (agreement or disagreement) from other groups
- individual reflection—then discussion with a group—the group comes to an agreement
- individual reflection—then discussion with a group— the group comes to an agreement instructor elicits response—then instructor elicits feedback (agreement or disagreement) from other groups
- partner discussion—individual writing for personal reflection
- partner discussion—agreement reached—group written or verbal response

	Critical thinking outcome		Workplace example
	Element of Reason - P	urpos	e, method or goal
1.1	Trainees formulate questions (clearly and precisely) that clarify the purpose, objective, goal or function of what they are learning.	•	With a partner, trainees brainstorm possible answers to a posed question regarding the purpose, relevance or function of what they are learning. Trainees then individually write three <i>different</i> questions which, when asked, elicit information to clarify the purpose of the lesson/thing/idea about which they are learning. The question is phrased so that the answer will be correct, precise and clear.
		Eg.	What is the purpose of?
			What role does play in?
			Is the function of to do?
1.2	Trainees can explain in their own words (clearly and precisely) the purposes and significance of what is happening during the lesson/activity.	•	Trainees explain the purpose of in a paragraph. Write a sentence stating what has happened during the lesson/or series of slides then elaborate by explaining the significance.
1.3	Trainees can explain in their own words (clearly and precisely) the purpose of reasoning through a problem/issue.	٠	Trainees evaluate in small groups or pairs the pros and cons of quick/impromptu decision versus planned, processed decision making.
1.4	Identify when they or other trainees are straying from the purpose at hand, and redirect the thinking back towards the purpose.	0	Within a given time frame, trainees verbally solve a complex problem/issue that requires a specific response (not the big picture, just how it affects individual or unit level).
1.5	Trainees regularly adjust their thinking to fit their ultimate purposes.	•	Trainees discuss in small groups how an issue may be interpreted from different points of view ² . Determine a group response—ie from a logistics, medical support and/or tactical point of view.
1.6	Trainees choose purposes and goals that are fair-minded, considering the relevant needs and rights of others (and assess the purposes of others for fairness.)	٠	Once indicating their own stance on an issue, trainees discuss the issue from different points of view in order to determine if their own point of view takes into account the needs and rights of others—ie how would this issue affect local civilians, the media, aid organisations and/or foreign militaries?

² **Point of view** is literally 'the place' from which you view something. It includes what you are looking at and the way you are seeing it. Your point of view or perspective can easily distort the way you see situations and issues. Make sure you understand the limitations of your point of view and that you fully consider other relevant viewpoints. Guidelines on Critical Thinking Concepts and Tools – Version 2.0 dated 7 Jun 07 by LTCOL Deb Bradford

	Element of Reason - Problem s	olvir	ig and answering questions
2.1	Trainees can express in their own words (clearly and precisely) the question ³ at issue.	•	Trainees write one sentence clearly and precisely stating what is the main problem, issue or point being taught/ discussed. Trainees are to clarify their question with a partner.
2.2	Trainees can re-express a question in a variety of ways (with clarity and precision).	•	Trainees rephrase a <i>big picture</i> questions. For example, if given <i>How</i> <i>will the terrain affect the operation?</i> Trainees will write three similar questions, using different words, which will elicit the same response.
2.3	Trainees can divide complex questions into sub-questions (accurately delineating the complexities in the issue).	•	Individually or in small groups, trainees identify the smaller information requirements that will solve/answer a larger issue/question?
2.4	Trainees can formulate significant questions within the topic.	•	Given a basic workplace or operational scenario of events, in small groups or individually, trainees identify big picture questions. What's the policy on A? or How will that policy/issue affect me on operations?
2.5	Before reasoning through a question, trainees accurately categorise the question, determining whether it is a question of fact or inference, or one that calls for reasoned judgement	•	When presented with a question (such as that posed in an essay), trainees discuss the best type of response. Should they use their own personal experience, conduct research, gather some data etc, or is it an open or closed question?
2.6	Trainees can distinguish conceptual questions from factual questions.	•	In regard to the topic/issue in the lesson, write a question of fact and one relating to the associated/related concepts (<i>bigger picture</i> questions).
		•	Given a series of questions, trainees are tasked to only answer the factual questions in class (<i>How many in a</i> ?), leaving the conceptual questions for homework (<i>What is the purpose of</i> theory and how does it affect ?).
2.7	Trainees can distinguish significant questions from trivial ones, relevant from irrelevant ones.	•	Trainees are to interview someone in regard to an incident/issue (brief scenario required). However, they can only ask three questions. Trainees are to write the questions down ensuring they are relevant and will achieve their

³ The question lays out the problem or issue and guides our thinking. When the question is vague, our thinking will lack clarity and distinctness. The question should be clear and precise enough to productively guide our thinking. Guidelines on Critical Thinking Concepts and Tools – Version 2.0 dated 7 Jun 07 by LTCOL Deb Bradford

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		_	information requirements.
2.8	Trainees can demonstrate sensitivity to the assumptions built into the questions they ask; they analyse and assess those assumptions for justifiability.		"When seeking information from a (source—interview, doctrine, intelligence report, publication etc) what assumption are we making about the information and how does that affect how we can use that information?" <i>Trainees write three</i> <i>assumptions about the source of</i> <i>information and how it may affect the</i> <i>validity of the information</i> .
2.9	Trainees can distinguish questions they can answer from those they cannot answer.	٠	Trainees sort identified information requirements into two groups: those for which they can get definite answers and those for which they cannot get answers but need to consider.
	Element of Reason - Data, information	on ⁴ , e	vidence, experience or research
3.1	Trainees express in their own words (clearly and precisely) the most important information in (a discussion, policy, doctrine, exercise)	•	Trainees write a paragraph summarising the most important issue in
3.2	Trainees distinguish the following related concepts: facts, information, experience, research, data and evidence.	•	 Given an example statement/report (or similar short document, trainees distinguish specified types of information. In a given example Demi-O, they highlight facts and underline personal experiences and opinions. In a given report, trainees identify examples of data or where there is evidence of research having been conducted.
3.3	Trainees can state their evidence for a view clearly and fairly.	9	Trainees discuss both sides of an issue/COA, brainstorming points in favour each side. After considering both sides, individual trainees select a stance, writing a paragraph outlining their stance and citing the evidence developed during their discussion.
3.4	Trainees distinguish relevant from irrelevant information when reasoning through a problem. They consider only relevant information, disregarding what is irrelevant.	•	Trainees are provided with a list of references from which trainee are required to discern which papers/reference are relevant to the topic/issue and which are not. This could include adding a political paper from the 1960s into a list of references for a security studies paper, or an unpublished/unofficial website into a

⁴ Information includes facts, data, evident, or experiences we use to figure things out. It does not necessarily imply accuracy or correctness (you must test for this). The information you use should be accurate and relevant to the question or issue you are addressing. Guidelines on Critical Thinking Concepts and Tools – Version 2.0 dated 7 Jun 07 by LTCOL Deb Bradford

			reference list for a technology brief.
3.5	Trainees actively search for information against, not just for, their own position.	•	Trainees write a sentence stating their belief on an issue/topic, then write possible reasons or arguments against their own point of view.
			 Indicate where you would site your ambush, then state three reasons why it may not be a good spot.
			 State whether you think is wrong, then state three reasons why it could be right.
		٠	Hold a debate on an issue—see Small group activities: Critical Debate
3.6	Trainees draw conclusions only to the extent that those conclusions are supported by the facts and sound reasoning. They demonstrate the ability to objectively analyse and assess information to come to conclusions based on the information.	•	Given some information to read or footage to view, trainees write a paragraph conclusion based on the information they have read/viewed, justifying how they came to that conclusion (what information informed their decision).
3.7	Trainees demonstrate understanding of the difference between information and inferences drawn from that information. They routinely delineate information and inferences in their own and others' reasoning	•	Given a piece of historical text, trainees dot-point the factual information and highlight the author's inferences/deductions. Given a document previously written by
	reasoning.		the trainee, ask the trainee to identify inferences/deductions they made and explain why/how they made them.
3.8	Trainees demonstrate understanding of the types of information used within particular discipline/corps, as well as understanding of how professionals within fields use information in reasoning through problems.	•	During a lesson, instruct trainees to make a glossary of all the new terminology/acronyms associated with that subject area. At various stages, stop and allow trainees to seek clarity from each other regarding what particular terms mean. At the end of the lesson, allow trainees to ask the instructor questions for final clarification. Trainees are to then write a paragraph answering a given question, demonstrating the correct use of those new terms.
	Element of Reason - Analysing inferen	ces ⁵ f	for conclusions, data and meaning
4.1	Trainees state, elaborate and exemplify the meaning of an inference.	•	Given a piece of text to read or footage to view, trainees state their own inference and then explain how any why they made it.
4.2	Trainees distinguish between		Given some video footage with a

⁵ Inferences are interpretations or conclusions you come to. Inferring is what the mind does in figuring something out. Inferences should logically follow from the evidence. Infer no more or less than what is implied in the situation. Guidelines on Critical Thinking Concepts and Tools – Version 2.0 dated 7 Jun 07 by LTCOL Deb Bradford

	inferences and conclusions.		scenario (without initially viewing the conclusion), allow trainees to infer their own conclusion (perhaps writing one or two sentences). Trainees are to then compare their conclusion with the actual conclusion. Discuss the differences.
4.3	Trainees distinguish between clear and unclear inferences.	٠	Present trainees with two pieces of research writing, one being a succinct, logical paragraph the other verbose and unclear. Task trainees to identify the main point/conclusion made in the paragraph and comment on whether it is logical. Compare/contrast the two pieces of writing.
4.4	Trainees make only those inferences that follow logically from the evidence or reasons presented.	•	Give trainees a policy document to read. Task them to write a paragraph answering a question similar to 'Is this action contravening the policy?' Trainees will need to ensure that they provide logical evidence to support their answer.
4.5	Trainees distinguish between deep and superficial inferences; they make deep, rather than superficial inferences when reasoning through complex issues.	٠	When solving an ethical dilemma, trainees investigate the scenario from a number of points of view to come to a justifiable conclusion.
4.6	Trainees reason to logical conclusions, after considering relevant and significant information.	•	Given a scenario with a series of supporting documents such as policies, statements and Routine Orders, trainees determine the most appropriate COA with justifications.
4.7	Trainees distinguish between consistent and inconsistent inferences; they make inferences consistent with one another.	•	After inferring their own conclusion from a piece of footage or text, trainees discuss in small group their own responses, discussing why they did or did not infer the same.
4.8	Trainees distinguish between assumptions and inferences; they uncover and accurately assess the assumptions underlying inferences.	•	Given a scenario and the subsequent assumption and inferences developed from it, trainees assess the likelihood of teach assumption and clarify the evidence that led to each inference.
		•	Given a scenario, trainees brainstorm assumptions and inferences. Trainees assess the likelihood of teach assumption and clarify the evidence that led to each inference.
4.9	Trainees notice inferences or judgements made within particular disciplines.	•	Trainees analyse a document (such a paragraph from a research paper) and highlighting the inferences made in the

			text.
	Element of Reason - Assumptio	ns ⁶	or beliefs taken for granted
5.1	Trainees accurately identify their own assumptions, as well as those of others.		After viewing footage or reading text on a cultural or security issue, trainees answer a question regarding the issue in a paragraph. On a separate piece of paper, trainees jot down their own assumptions regarding the issue.
			Trainees then swap paragraph answers with another trainee and try identify the assumptions the other trainee has made regarding the issue, based on how they answered the question.
		•	See Small Group Activities: Critical conversation protocol
5.2 Trainees make a reasonable and situation and evi	Trainees make assumptions that are reasonable and justifiable, given the situation and evidence.	9	Given a detailed scenario (such as a likely enemy COA), trainees brainstorm assumptions based on the scenario information. Trainees then assess each assumption, deciding whether, based on the information that they have been provided, it is reasonable.
		•	Also See Small Group Activities: Critical conversation protocol
5.3	Trainees make assumptions that are consistent with one another.	•	After viewing/reading a scenario, trainees individually write assumptions about a specified aspect of the event/s (the cause, persons involved, likely motives, strengths, morale, likely next actions etc). Trainees discuss assumptions with a partner or group, discussing the cause of any inconsistencies.
5.4	Trainees are aware of the natural tendency in others to use stereotypes, prejudices, biases and distortions in their reasoning; they regularly identify their own stereotypes, prejudices, biases and distortions; they demonstrate skill in accurately identifying the stereotypes, prejudices, biases and distortions in the thinking of others.	•	Trainees first brainstorm how stereotypes, prejudices and biases may hinder inferences they make regarding an issue. For example, how could their professional and educational background affect their opinion on an issue?
		Trainees are then given information on an incident including witness statements and possibly footage of interviews. Trainees infer conclusions regarding the incidents, and then discuss how their	

^o Assumptions are beliefs you take for granted. They usually operate at the subconscious or unconscious level of thought. Make sure that you are clear about your assumptions and they are justified by sound evidence. *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.' (Col W. Michael Guillot, 2004, *Critical Thinking For The Military Professional' in Air & Space Power Journal - Chronicles Online Journal, 17 June.)

			own personal stereotypes, prejudice and bias have affected those inferences.
5.5	Trainees accurately state the assumptions underlying the inferences they (or others) make and then accurately assess those assumptions for justifiability.	٠	After reviewing some text in which the author has reached a conclusion, trainees brainstorm the assumptions the author would have to have made in order to reach that conclusion. Trainees then assess whether the author was justified making that assumption.
			 He would have assumed the interviewee was telling the truth. However, since the witness's statements were very vague and the witness is closely related to the person being investigated, so the assumption accuracy is not justified.
			 This COA is based on the assumption that unit 'A' will reach point 'B' in time; however, considering the terrain and XXX, this assumption is/is not justified.
5.6	Trainees demonstrate recognition that the mind naturally (egocentrically ⁷) seeks to hide unjustifiable assumptions in the mind in order to maintain its belief system or pursue selfish ends.		ТВА
5.7	Trainees seek out, in their thinking, unjustifiable assumptions generated and maintained through native egocentric tendencies.	•	TBA
5.8	Trainees accurately identify assumptions within disciplines and texts.	•	ТВА
5.9	Trainees identify the assumptions embedded in the concepts they use and the theories they study.	٠	ТВА
Elem	ent of Reason - All thinking is expresse	d thr	ough and shaped by concepts and ideas
6.1	Trainees are able to state, elaborate and exemplify what a concept is.	٠	After reading material dealing with a broad concept, trainees write a short paragraph that explains the concept in their own words. Trainees are to use clear examples and tailor their writing to an audience who is not familiar with the concept.
6.2	Trainees demonstrate understanding of	6	ТВА

⁷Egocentricity is a tendency to view everything in relationship to oneself. One's desires, values, and beliefs (seeming to be self-evidently correct or superior to those of others) are often uncritically used as the norm of all judgment and experience. (Glossary of Critical Thinking Terms (June 1996). Foundation For Critical Thinking, Online at website: www.criticalthinking.org) Guidelines on Critical Thinking Concepts and Tools - Version 2.0 dated 7 Jun 07

by LTCOL Deb Bradford

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	the following distinctions: theories, principles, definitions, laws, and axioms. (They can accurately state, elaborate, and exemplify each one)		
6.3	Trainees identify the key concepts and ideas they and others use.	9	After developing a plan, COA or Defence document, trainees check to see if their plan/COA/document adheres to relevant principles or theories. Trainees swap work and analyse each other's work in order to identify where their partner has/has not adhered to the principles/theories. Trainees then brief each other on their findings.
			 trainees check each other's TEWT plans for adherence to tactical theories and principles
		0	 trainees check each other's Defence correspondence for adherence to the principles of effective writing
6.4	Trainees are able to accurately explain the implications of the key words and phrases they use.	•	Using their own words, trainees write a sentence explaining the implications/meaning of key mission/task verbs.
6.5	Trainees distinguish non-standard uses of words from standard ones.	٠	ТВА
6.6	Trainees are aware of irrelevant concepts and ideas and use concepts and ideas in ways relevant to their functions.	•	тва
6.7	Trainees think deeply about the concepts they use.	٠	ТВА
6.8	Trainees analyse concepts and draw distinctions between related but different concepts.	•	ТВА
6.9	Trainees use language with care and precision, while holding others to the same standards.	٠	After completing a written task that requires the trainees to clearly and accurately demonstrate their understanding of a concept, trainees swap their written work with a partner. Trainees then analyse their partner's work in order to ensure the language is precise (see Intellectual Standards – page 6).
6.10	Trainees demonstrate awareness of the mind's natural tendency to distort concepts in order to maintain a particular viewpoint or set of beliefs; they show a propensity to identify when concepts are being misused.	9	ТВА

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