



A Systematic Process for Critical Thinking

“The essence of the independent mind lies not in what it thinks, but in how it thinks.”

— Christopher Hitchens, *Letters to a Young Contrarian*

Critical thinking can sometimes be a convoluted and mysterious process; this resource provides a systematic, critical thinking method that makes it a lot less puzzling. We know that critical thinking is necessary and crucial for our work, but how do we get to the “Oh! I know!” or “Hmmm, what if we...” moments? Those “aha” moments don’t always come quickly enough and some specific steps and questions can help us get there. Sometimes the “aha” comes from another team member. Other times we hear a great idea or see a different perspective that we hadn’t considered that gets us thinking in a new or different direction. What are some things we can do to foster an environment full of “aha” moments?

First let’s agree on what we mean by critical thinking. It is “Thinking about thinking” thus making us able to **take charge** of our own thinking. UF professor, Dr. Alexa Lamm, (2016) defines it as, “A reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information and for which an *incontrovertible solution* is unlikely.”

As leaders, we use critical thinking to help us make well thought-out evaluations and judgements in tasks such as strategic planning, project management, evaluating business processes, listening to co-workers, mediating conflicts and solving complex problems.

Critical thinking processes are most often used **with ill-defined problems**, i.e., problems that are complex and do not have clear outcomes or an expected solution. There is no “correct” answer for these problems. However, there are better ways to approach the problem in order to produce the desired results. These types of problems are adaptive and require a systematic approach. Without it the team may fail to reach its strategic goals.

How can you use this systematic process for critical thinking to achieve the best results?

To achieve the best results, it is recommended that you complete the entire process following the steps in order, while diving deeply into the questions provided in the chart below. All steps are necessary to ensure your team systematically creates a thoroughly considered solution for the problem.

Characteristics of a critical thinker.

Consider your interactions at work. Can you answer yes to the following statements?

- I can work with someone new by making a logical plan.
- I can tell the difference between facts and opinions.
- I evaluate evidence to decide whether an opinion is reasonable.
- I change my mind when I find evidence that shows I may not be correct.
- I can look at a problem from different angles.
- I can ask relevant and probative questions.
- I recognize preconceptions, bias, and values in myself and others.
- ***I can question the bases for my own beliefs and opinions.***

A Systematic Process for Problem Solving which Requires Critical Thinking



1 Interpretation
Team members ask questions to clarify the problem. What is happening, what is the significance and who is involved?

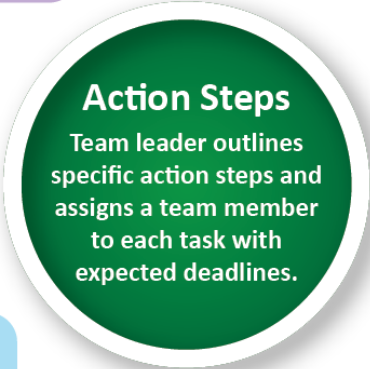
2 Analysis
Team members discuss the problem, exploring each person's judgments, arguments, opinions, and conclusions. What evidence is provided to backup the team's experiences, beliefs and opinions shaping the ideas?

3 Inference
Team members brainstorm possible solutions using all data and information available. What facts are used to draw reasonable conclusions? What are the possible alternatives? What are the consequences of these conclusions?

▶▶▶ *Take a break for some think time and reflection.* ◀◀◀
Gather additional data and information as needed.

Evaluation
Team members recap from previous meeting and team lead asks questions about their reasoning and conclusions. Team members evaluate the validity of their argument or solution. **4**

Explanation
Team members formally verbalize and outline their explanation of their proposed decision or solution. **5**



Self-Regulation
Team leader questions, confirms, validates and connects the proposed decision or solution to ensure a complete process and conclusion. **6**

NOTE: Specific questions and descriptions for the process are in the table below.

Roles for Problem Solving or Decision Making Meetings

It can be helpful to use roles during the process and highly recommended to set a time limit for each section. Consider the following roles to facilitate the best possible outcome during the critical thinking process.

1. **Team Leader or Presenter:** Presents the facts of the challenge, problem or situation to the team. Listens to the team's brainstorming.
2. **Facilitator:** Main responsibility is to ask the process questions of the presenter and the group, manage the time boundaries and keep the team leader/presenter from controlling the conversation.
3. **Timekeeper:** Monitors time and informs the facilitator and the group of the elapsed time allotments. Helps keep people focused and on task.
4. **Note-taker:** Responsible for capturing a record of the group's discussion for the case presenter, thus freeing-up the team leader/presenter to listen and attend to the group's conversation.

Problem Solving or Decision Making Meeting Agenda Template

PROBLEM	<p>PRESENTATION – The team leader or presenter will describe the facts of the challenge, problem or situation to the team as well as any solutions that have previously been tried.</p>	<p><u>Suggested Timing:</u> 5 min</p> <p>It is helpful to provide a written description of the problem prior to the session.</p>
1. INTERPRETATION	<p>INTERPRETATION – To clarify the problem or situation and ensure that all team members have a common understanding of the issue.</p> <ul style="list-style-type: none"> • Consider the 5W's: who, what, when, why, where and how • What's happening? • Who are the people involved? • Who has ownership or a high stake in the process? • What is the best way to characterize, categorize, or classify this? 	<p><u>Suggested Timing:</u> 10 min</p> <p>Team members ask questions to clarify the problem.</p> <p>Once the team members feel that they understand the problem deeply, they are ready to move on to ANALYSIS.</p>
2. ANALYSIS	<p>ANALYSIS – To discuss the problem thoroughly, exploring the intended and actual inferential relationships among the statements and questions from the team members. Consider each person's perspective, beliefs, assumptions and opinions. Analyze the facts and any metrics available to corroborate the evidence.</p> <ul style="list-style-type: none"> • Tell us your reasons for making that claim. • What is your conclusion? • What are you claiming? • Why do you think that? • What are the arguments (pros and cons)? • What assumptions must we make to accept that conclusion? • What is your basis for saying that? • What are the underlying or hidden issues? • What would success look like to all of the people involved in the problem? • What has the team leader/presenter contributed to the problem? 	<p><u>Suggested Timing:</u> 20 min</p> <p>Team members discuss the problem, explore each person's judgements, arguments, opinions, and conclusions. The team leader <u>listens</u> to the discussion.</p> <p>Once the team members feels they have explored the questions, they are ready to move on to INFERENCE.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">3. INFERENCE</p>	<p>INFERENCE – To identify and secure elements needed to draw reasonable conclusions. The team will use the data, statements, principles, evidence, beliefs, and opinions from the analysis phase and brainstorm ideas. This is a time to identify possible solutions and discuss the viability of each solution.</p> <ul style="list-style-type: none"> • Given what we know so far, what conclusions can we draw? • Given what we know so far, what can we rule out? • What does this evidence imply? • If we abandoned or accepted that assumption, how would things change? • What additional information do we need to resolve this question? • If we believe these things, what would they imply for us going forward? • What are the consequences of doing things that way? • What are some alternatives we haven't yet explored? • Let's consider each option and see where it takes us. • Are there any undesirable consequences that we can and should foresee? 	<p><u>Suggested Timing:</u> 20 min</p> <p>Team members brainstorm possible solutions using all the information available. The team leader can provide input and direction, if desired.</p> <p>Once the team members feels they have explored all the information, data and questions, a break is recommended.</p> <p>When the team reconvenes, they are ready to move on to EVALUATION, starting with a recap of the process and possible solutions.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">4. EVALUATION</p>	<p>EVALUATION – To assess the credibility of the solutions from the inference phase and review any new evidence and ideas generated since the prior session. Evaluate with fresh eyes the validity of the possible solutions and probe for weaknesses in thinking and logic.</p> <ul style="list-style-type: none"> • How credible is the claim? • Why do we think we can trust what this person claims? • How strong are those arguments? • Do we have our facts right? • How confident can we be in our conclusion, given what we now know? • What are the consequences of this solution? • What would it look like in a year if we implemented this solution? 	<p><u>Suggested Timing:</u> 10 min</p> <p>Start by recapping the process, possible solutions and how the team arrived at them.</p> <p>Team leader asks questions about the possible solution. Then team members evaluate the validity of their argument or solution.</p> <p>Once the team members feel they have thoroughly evaluated their argument or solution, they are ready to prepare their EXPLANATION and consider action steps.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">5. EXPLANATION</p>	<p>EXPLANATION – To describe the process the team went through to arrive at the solutions. Clarifying the thinking process provides context for how the thought process evolved.</p> <ul style="list-style-type: none"> • What were the specific findings or results of the investigation? • Describe how you conducted that analysis. • How did you come to that interpretation? • Take us through your reasoning one more time. • Why do you think that was the right answer or the solution? • How would you explain why this particular decision was made? • What is the context in which you made this decision? 	<p><u>Suggested Timing:</u> 10 min</p> <p>Team members verbalize and outline their explanation of their proposed decision or solution.</p> <p>Once the team members have consensus on the proposed decision or solution, they present to the leader.</p>

6. SELF-REGULATION	<p>SELF-REGULATION – To consciously check your thinking and evaluate your potential biases. Evaluate the team’s inferential judgments with a view toward questioning, confirming, validating, or connecting either one’s reasoning or one’s results.</p> <ul style="list-style-type: none"> • Our position on this issue is still too vague. Can we be more precise? • How good was our methodology, and how well did we follow it? • Is there a way we reconcile these two apparently conflicting conclusions? • How good is our evidence? • OK, before we commit, what are we missing? • I’m finding some of our definitions a little confusing. Can we revisit what we mean by certain things before making any final decisions? 	<p><u>Suggested Timing:</u> 10 min</p> <p>Team leader questions, confirms, validates and connects the proposed decisions or solutions to ensure a complete process and conclusion.</p> <p>Once the team has reflected and feels confident in the solution, prepare to create specific action steps.</p>
EXECUTION	<p>ACTION STEPS – The team leader or facilitator outlines <u>specific action steps</u> and assigns a team member to each task with expected deadlines.</p> <p>Finally the team leader closes the process by asking for the team’s input on the process. What worked well and what can be improved for future problem solving sessions.</p>	<p><u>Suggested Timing:</u> 15 min</p> <p>It is helpful to put the action steps into a shared excel sheet so all team members can monitor the implementation.</p>

Summary

Using this process will not only aid your team in making well thought-out decisions on complex and ill-defined problems, but it will also provide a foundation for your team members to practice their critical thinking skills. When asking for feedback on any project, your team will learn to pose a series of questions first rather than stating their opinion. This is a reflective practice that creates deeper thinking and a meaningful conversation about the work.

Consider this process for strategic planning, project management, evaluating business processes, listening to co-workers, mediating conflicts and solving complex problems. Find the root cause, make informed decisions, and be sure to execute with trackable action steps!

Sources:

Lamm, A. J. (2015). Integrating Critical Thinking into Extension Programming #1: Critical Thinking Defined. University of Florida. <http://www.edis.ifas.ufl.edu/>.

Facione, P. (2007). Critical thinking: What it is and why it counts. Millbrae, CA: Insight Assessment, California Academic Press.

American Philosophical Association, *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction*. "The Delphi Report," Committee on Pre-College Philosophy. (ERIC Doc. No. ED 315 423). 1990

For more information on critical thinking styles, visit UF Critical Thinking Inventory <http://www.ufcti.com/> and the UF/IFAS Center for Public Issues Education (PIE center) <http://www.piecenter.com/>.