

**Religious Education Support  
Second Level Support Service**

## **Critical thinking skills**

Critical thinking is...

*'the mental process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information to reach an answer or conclusion'*

Source: <http://dictionary.reference.com/browse/critical%20thinking>

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'Critical thinking consists of mental processes of **discernment, analysis and evaluation**. It includes possible processes of reflecting upon a tangible or intangible item in order to **form a solid judgment** that reconciles scientific evidence with common sense.'

114k - 16 sec @ 56k en.wikipedia.org/wiki/Critical\_thinking en.wikipedia.org/wiki/Critical\_thinking

### **What is critical thinking and why is it important?**

Critical thinking is the ability to think clearly and rationally. It includes the ability to engage in **reflective and independent thinking**. Someone with critical thinking skills is able to do the following :

- understand the logical connections between ideas
- identify, construct and evaluate arguments
- detect inconsistencies and common mistakes in reasoning
- solve problems systematically
- identify the relevance and importance of ideas
- reflect on the justification of one's own beliefs and values

Other definitions of critical thinking have been proposed... It can be seen that clarity and rationality constitute the common core across the different conceptions on critical thinking.

Critical thinking is not a matter of accumulating information. A person with a good memory and who knows a lot of facts is not necessarily good at critical thinking. A critical thinker is able to **deduce consequences from what he knows**, and he knows **how to make use of information to solve problems**, and to seek relevant sources of information to inform himself.

Critical thinking should not be confused with being argumentative or being critical of other people. Although critical thinking skills can be used in exposing fallacies and bad reasoning, critical thinking can also play an important role in cooperative reasoning and constructive tasks. Critical thinking can help us acquire knowledge, improve our theories, and strengthen arguments. We can use critical thinking to enhance work processes and improve social institutions.

Good critical thinking might be seen as the foundation of science and a liberal democratic society. Science requires the critical use of reason in experimentation and theory confirmation. The proper functioning of a liberal democracy requires citizens who can think critically about social issues to inform their judgments about proper governance and to overcome biases and prejudice.

### Why study critical thinking?

Critical thinking is a domain-general thinking skill. The ability to think clearly and rationally is important whatever we choose to do. If you work in education, research, finance, management or the legal profession, then critical thinking is obviously important. But critical thinking skills are not restricted to a particular subject area. Being able to think well and solve problems systematically is an asset for any career.

Critical thinking is very important in the new knowledge economy. The global knowledge economy is driven by information and technology. One has to be able to deal with changes quickly and effectively. The new economy places increasing demands on flexible intellectual skills, and the ability to analyse information and integrate diverse sources of knowledge in solving problems. Good critical thinking promotes such thinking skills, and is very important in the fast-changing workplace.

Critical thinking enhances language and presentation skills. Thinking clearly and systematically can improve the way we express our ideas. In learning how to analyse the logical structure of texts, critical thinking also improves comprehension abilities.

Critical thinking promotes creativity. To come up with a creative solution to a problem involves not just having new ideas. It must also be the case that the new ideas being generated are useful and relevant to the task at hand. Critical thinking plays a crucial role in evaluating new ideas, selecting the best ones and modifying them if necessary.

Critical thinking is crucial for self-reflection. In order to live a meaningful life and to structure our lives accordingly, we need to justify and reflect on our values and decisions. Critical thinking provides the tools for this process of self-evaluation.

Although most people would agree that critical thinking is an important thinking skill, most people also do not know how to improve their own thinking. This is because **critical thinking is a meta-thinking skill**. It requires careful reflection on the good principles of reasoning and making a conscious effort to internalize them and apply them in daily life. This is notoriously hard to do and often requires a long period of training.

### Other definitions of critical thinking

The Watson-Glaser Critical Thinking Appraisal is a well-known psychological test of critical thinking ability. The authors of this test define critical thinking as :

*... a composite of attitudes, knowledge and skills. This composite includes: (1) attitudes of inquiry that involve an ability to recognize the existence of problems and an acceptance of the general need for evidence in support of what is asserted to be true; (2) knowledge of the nature of valid inferences, abstractions, and generalizations in which the weight or accuracy of different kinds of evidence are logically determined; and (3) skills in employing and applying the above attitudes and knowledge.*

The following excerpt comes from Dr. Peter A. Facione (1990) "Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction", a report for the American Philosophical Association.

"We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. **The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit.** Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society."

The last excerpt comes from a statement written by Michael Scriven and Richard Paul, National Council for Excellence in Critical Thinking, an organization promoting critical thinking in the US.

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness. It entails the examination of those structures or elements of thought implicit in all reasoning: purpose, problem, or question-at-issue, assumptions, concepts, empirical grounding; reasoning leading to conclusions, implications and consequences, objections from alternative viewpoints, and frame of reference.

<http://philosophy.hku.hk/think/critical/ct.php>

### **What Is Critical Thinking?**

Critical thinking consists of three steps:

\* **1. Becoming aware that assumptions exist**

\* **2. Making assumptions explicit**

\* **3. Assessing their accuracy**

o Do these assumptions make sense?

o Do these assumptions fit reality as we understand and live it?

o Under what conditions do these assumptions seem to hold true? Under what conditions do they seem false?

### **Misconceptions about Critical Thinking**

\* It is wholly a negative process--it tears down ideas and puts nothing in their place (rather it is a positive process to put things in a more realistic perspective).

\* It will lead to relativistic freeze--the inability to make commitments to people, ideas, structures (rather, commitments are informed ones).

\* It seems to involve traumatic change--one is expected to abandon old assumptions continually. (rather: Some beliefs stay the same--they are simply more informed).

\* It is dispassionate and cold (it is rather highly emotive and liberating to be free of past assumptions and the anxiety of self-scrutiny).

### **Why Is Critical Thinking Important?**

\* All actions, decisions and judgments spring from assumptions--if they are unchecked or inappropriate, we will make poor decisions and wrong judgments.

\* In personal relationships we learn to keep our lines of communications open--we avoid uncritically reproducing patterns of the modeled interactions we learned from our parental interaction.

\* In the workplace we avoid stagnation and atrophy and are willing to challenge the current paradigms which are uncritically accepted and may have come down in the workplace from a time and thinking which is no longer relevant to our current reality.

### **What Does the Absence of Thinking Critically Look Like?**

\* We blindly reproduce the damaging reactions we have learned.

\* We blindly accept at face value all justifications given by organizations and political leaders.

\* We blindly believe TV commercials.

\* We blindly trust political commercials.

\* We blindly accept and say that if the textbook says it, it must be so.

\* We blindly accept and say that if the organization does it, it must be right.

### **What Does Critical Thinking Look Like?**

- \* **Contextual sensitivity**--being sensitive to stereotypes about people from a particular group and trying to accept others at face value unconditionally
- \* **Perspective thinking**--trying to get into the other person's head, or walking in the other person's shoes so as to see the world the way that person sees and perceives the world.
- \* **Tolerance for ambiguity**--ability to accept multiple interpretations of the same situation
- \* **Alert to premature ultimatums**--invoking a powerful idea or concept which inspires such reverence that any further debate is forestalled. E.g., a politician invokes "democracy."

### **Characteristics of People who Excel at Critical Thinking**

- **Truth seeking:** A courageous desire for the best knowledge, even if such knowledge fails to support or undermines one's preconceptions, beliefs or self-interests.
- **Open-mindedness:** Tolerance to divergent views, self-monitoring for possible bias.
- **Analyticity:** Demanding the application of reason and evidence, alert to problematic situations, inclined to anticipate consequences.
- **Systematicity:** Valuing organization, focus and diligence to approach problems of all levels of complexity.
- **Critical Thinking Self-Confidence:** Trusting of one's own reasoning skills and seeing oneself as a good thinker.
- **Inquisitiveness:** Curious and eager to acquire knowledge and learn explanations even when the applications of the knowledge are not immediately apparent.
- **Cognitive Maturity:** Prudence in making, suspending or revising judgment. An awareness that multiple solutions can be acceptable. An appreciation of the need to reach closure even in the absence of complete knowledge.

These characteristics are measured by California Critical Thinking Dispositions Inventory:  
[www.calpress.com/cctdi.html](http://www.calpress.com/cctdi.html).

### **What Are the Major Components in Critical Thinking?**

- \* Perception
- \* Assumptions
- \* Emotion
- \* Language
- \* Argument
- \* Fallacy
- \* Logic
- \* Problem Solving

#### **Perception**

- \* The way we receive and translate our experience.
- \* Also a significant filtering system.
- \* How we perceive defines how we think.

#### **Assumptions**

- \* Central to Critical Thinking
- \* Implied, not conscious of them
- \* Not always bad
- \* Rest on notion some ideas are obvious
- \* Make us comfortable with present beliefs and shut out alternatives

#### **Emotion**

- \* Trying to "leave emotion out of it" is impossible.
- \* Part of everything we do and think.
- \* Personal barriers are a given.
- \* Critical thinkers don't ignore or deny emotions; accept and manage them.

## **Language**

- \* Thinking can't be separated from language
- \* Three primary purposes: inform, persuade and explain.
- \* Language denotes and connotes.
- \* Metaphors.

## **Metaphors**

Metaphors are powerful language tools that influence how we think and problem solve. Metaphors are figures of speech which can give great color and depth to our language. Metaphors can be short phrases, stories or poems. A metaphor is a verbal message which can be easily visualized by the reader or listener.

## **Argument**

- \* Claim, used to persuade that something is (or not) true or should (or not) be done
- \* Contains three basic elements
  1. Issue
  2. One or more reasons (premises)
  3. One or more conclusions
- \* Can be valid or invalid based on structure
- \* Only premises and conclusions true or false
- \* Goal of Critical Thinking is sound arguments
- \* Valid (proper structure)
- \* With true premises
- \* Sound argument has both: so the conclusion must be true
- \* Therein the beauty and usefulness of logic

## **Fallacy**

- \* Reasoning that doesn't meet criteria for sound argument is fallacious
- \* Valid
- \* True premises
- \* Complete (all relevant information)
- \* Fallacy is incorrect pattern of reasoning
- \* Does not always mean conclusion is false
- \* Ads and editorials

## **Logic**

Two methods of reasoning:

### **1. Deductive**

- \* Facts, certainty, syllogisms, validity, truth of premises sound arguments and conclusions

### **2. Inductive**

- Diverse facts, probabilities, generalizations, hypotheses, analogies

## **Problem Solving**

- \* Logic problems like any problem
- \* Techniques:
  - \* Understand the problem
  - \* Identify unknowns and knowns
  - \* Relationships between these (visual aids)
  - \* Generate strategy from step above
  - \* Apply and solve; repeat if necessary

## **Requirements for Effective Critical Thinking**

Six Cognitive Skills

1. Interpretation
2. Analysis
3. Evaluation

4. Inference
5. \*Explanation
6. Self-regulation

### **Interpretation**

- Comprehend and express meaning or significance of wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures or criteria.

### **Analysis**

- Identify the intended and actual inferential relationships among statements, questions, concepts, descriptions or other forms of representation intended to express belief, judgment, experiences, reasons, information or opinion.

### **Evaluation**

- Assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgment, 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.

### **Inference**

- Identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to deduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions or other forms of representation.

### **Explanation**

- State the results of one's reasoning; justify that reasoning in terms of 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.

### **Self-regulation**

- Self-consciously to monitor one's cognitive activities, the elements used in those activities and the results deduced, particularly by applying skills in analysis and evaluation to one's own inferential judgments with a view toward questions, confirming, validation or correcting either one's reasoning or results..

### **Affective Dispositions**

- \* Something else is needed.
- \* More to Critical Thinking than just cognitive skills.
- \* Human beings more than just thinking machines.
- \* "the Critical Spirit" (affective dispositions).
- \* A probing inquisitiveness.
- \* A keenness of mind.
- \* A zealous dedication to reason.
- \* A hunger or eagerness for reliable information.

### **Critical Thinking is:**

- \* How you approach problems, questions and issues.
- \* The best way we know to get to the truth.
- \* Experts conclude: Critical Thinking is a pervasive, purposeful human phenomenon.
- \* Ideal critical thinker characterized also by how he/she approaches life and living in general.

### **Approaches to life characterizing good Critical Thinking:**

- Inquisitiveness about wide range of issues.
- Concern to become and stay well-informed.
- Alertness to opportunities to use Critical Thinking.
- Self-confidence in one's abilities to reason.
- Open-mindedness about divergent world views.
- Flexibility in considering alternatives and opinions.
- Understanding the opinions of other people.
- Fair-mindedness in appraising reasoning.
- Honesty in facing one's own biases, prejudices, stereotypes, egocentric and sociocentric tendencies.
- Prudence in suspending, making, altering judgments.
- Willingness to reconsider and revise views.
- Clarity in stating question or concern.
- 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.
- Precision to the degree permitted by subject and circumstances.

### **Value of Critical Thinking**

- Significant correlation between Critical Thinking scores and college GPA.
- Critical Thinking skills can be learned.
- Significant correlation between Critical Thinking and reading comprehension.

### **Main Purpose of College Experience**

\* Achievement of liberal (liberated) education. It's about learning to learn; learning to think for one's self; leads away from naive acceptance of authority; leads above self-defeating relativism.

\* Beyond ambiguous contextualism.

\* Culminates in principled, reflective judgment.

### **All of Us Need Critical Thinking and Thinkers**

- Critical Thinking is fundamental, if not essential for, a rational and democratic society.
- Electorate
- Judiciary
- International commerce
- Business and civic leaders maybe more interested in Critical Thinking than even educators.
- Necessary condition for the success of democratic institutions and free market society.

### **Role of Language in Critical Thinking and Problem Solving**

#### **Language is used for three purposes:**

\* To describe

\* To inform

\* To persuade

Persuasion is the manner by which we attempt to convince others to "our way of thinking" about a subject therefore:

\* Logic

\* Fallacious reasoning

\* Problem-solving involves persuasion

Language Forms:

\* Emotionally charged language-cognitive vs emotional meanings

\* Manipulative language: cons, doublespeak and jargon

- \* Rhetorical devices
  - o Slanting
  - o weasel words
  - o fine print disclaimers
  - o obfuscation
- \* Emotional appeal-Advertising

### **Logic in Critical Thinking**

Deduction vs. Induction Logic (Scientific Method)

#### **Deduction**

- Draw a conclusion that follows known facts stated in premises.
- Relies on certainty based on connection of premises and conclusion.
- Valid Argument vs. Sound Argument.
- Deductive reasoning can be used when the premises (reasons, facts, evidence, etc.) prove with absolute certainty that the conclusion is true, assuming the premises are true.

#### **Induction**

- Derives probable conclusion from observation of diverse facts.
- Learning from experience.
- Argument by analogy.
- Hypothetical Reasoning.
- Inductive Reasoning is required when you cannot ascertain the absolute certainty of the conclusion based on given evidence, but you can establish probability.

### **Terminology**

- \* Inductive strength: deductive validity, truth of premises.
- \* Probability: how certain are you.
- \* Reasoning from diverse facts: reasoning from known facts or assumed known facts.
- \* Types of Logical Arguments:
  - o Generalization arguments
  - o Hypothesis arguments
  - o Analogical arguments
  - o Conditional arguments
  - o Syllogisms
  - o Venn Diagrams

### **Five Most Common Fallacies**

1. Non Sequitur--irrelevant reason-premise no relationship to conclusion.
2. Ad hominum-person's character attacked to discredit arguer rather than argument.
3. Post hoc ergo propter hoc--generalization--one event which follows was caused by first.
4. Slippery slope--black and white--no gray or middle ground--argues against first step since eventually follow through to the last one.
5. Appeal to Emotion-emotional appeals rather than logical reasons to persuade.

### **Logic Problems**

- \* The Premise--establishes the setting of the problem, subjects, how subjects are related, number of subjects (4 to 10).
  - \* The Conditions--rules which impose specific restrictions upon relationship among subjects (2 to 10 conditions).
  - \* The Question--questions about relationship-require deductive analysis.
- Adapted from: <http://www.livestrong.com/article/14710-overview-of-critical-thinking/>

Students who can successfully negotiate "Writing and Reading Arguments," from dualism to relativism, should make significant strides as critical thinkers. They should be able to leave their dualism and recognize **the possibility of other positions as compelling and plausible as their own**. They should be able to collect information, synthesize a variety of positions, and develop criteria for choosing and arguing for a position that contributes to the ongoing public debate. As they learn to argue, students will also learn to:

- 1. articulate and support their own beliefs as they participate in an ongoing discussion.**
- 2. recognize pluralism, complexity, and uncertainty as legitimate and positive forces in the making of knowledge, rather than subjective and subversive of knowledge.**
- 3. move beyond repeating received knowledge to inquiry and analysis.**
- 4. develop ways of discussing, analyzing, and resolving complex issues that have no single right answer.**

Throughout this process, students will be encouraged to engage in effective critical thinking practices. These include:

- listening to and investigating all sides of an issue
- defining the problem carefully and completely
- provisionalism: being willing to change a position when shown reasons and evidence
- seeking alternative solutions and divergent views in an attempt to choose the best solution
- realizing that the best is not the same for everyone
- remaining open to others' values
- question and compare conflicting interpretations of data
- assessing the strength of reasoning and support
- evaluating conclusions
- applying values to reach or evaluate conclusions

Source: <http://www.abacon.com/compsite/instructors/online/developing.html>

### **Coursework:**

One way of using critical thinking skills in Coursework is to conduct research on the chosen prescribed title using a variety of sources across a reasonable range. In the course of one's enquiry we might ask questions to find out relevant information about the topic under investigation. We might look at why we agree or disagree with various perspectives and what underlying assumptions drive our position and the position of the authors of the sources. We may need to reflect on various positions. We might ask ourselves which sources support certain perspectives and why, and which do not support a certain view and why. We may need to look at possible bias or assumptions and may need to challenge them.

Having examined various sources and perspectives we might begin to formulate our own conclusions about the title under investigation, taking into account the evidence, sources and perspectives we have read and studied.

The process of the investigation and reflection is just as valuable as the end product of Coursework itself. Encourage students to THINK independently, to see things from different perspectives, and to engage in discussion and reflection with others so that their thought processes can develop. Encourage them to form judgments on the information they gather, and to assess the significance of the data. Often the reflective exercise whereby students engage in a group discussion on a particular title, will enhance the quality of learning for each individual, since they will hear questions raised...leading to further questions, new information comes to light, new perspectives are shared. Sometimes it may be appropriate not to be too definitive or closed in an approach to a topic. Sometimes there are no 'right' or 'wrong' answers as such and the 'in-between' domain might need attention. Nevertheless, encourage students to reach conclusions on their findings. Consider having students make note of what they know and think about a particular topic at the beginning of the Coursework process. Towards the end of the investigation and the reflection, encourage students to write down (points) what they now know about the topic. Then direct their reflection to what has remained the same and what has changed in the process.

Encourage their reflection with some questions (these may also be the focus of a class discussion and reflective teaching activity exercise) – e.g.

- What knowledge and understanding has developed for me?
- How much more informed am I about this topic? How did this happen?
- What pre-conceived ideas / thoughts / attitudes / feelings / biases did I have about this topic when I first chose to study it and how is this similar or different at the end of the Coursework process.
- What ideas / beliefs / attitudes did I hold that have been confirmed as a result of my investigation into this title?
- What ideas / beliefs / attitudes did I hold that have been challenged as a result of my investigation into this title?
- Was there any progression in my level of questioning? Did I begin to formulate deeper questions as I progressed? Did I attempt to find answers / perspectives on any of these questions?
- Why does this particular topic matter today? Who are the proponents of an idea? Who are the critics? How much validity can we afford to give to various commentators and their sources?
- Etc

A co-operative approach to learning, rather than a competitive approach, will almost certainly enhance student learning in this area.

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