Critical Thinking

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Critical Thinking

- "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" (Scriven, 1996).
- "Critical thinking is thinking that assesses itself" (Center for Critical Thinking, 1996b).
- Critical thinking is the ability to think clearly and rationally, understanding the logical connection between ideas.
- Critical thinking might be described as the ability to engage in reflective and independent thinking.

- In essence, critical thinking requires you to use your ability to reason. It is about being an active learner rather than a passive recipient of information.
- Critical thinkers rigorously question ideas and assumptions rather than accepting them at face value. They will always seek to determine whether the ideas, arguments and findings represent the entire picture and are open to finding that they do not.
- Critical thinkers will identify, analyse and solve problems systematically rather than by intuition or instinct.

Characteristics of Critical Thinking

- Wade (1995) identifies eight characteristics of critical thinking.
- Critical thinking involves -
  - asking questions,
  - defining a problem,
  - examining evidence,
  - analysing assumptions and biases,
  - avoiding emotional reasoning,
  - avoiding oversimplification,
  - considering other interpretations, and
  - tolerating ambiguity.

- Another characteristic of critical thinking identified by many sources is metacognition. Metacognition is thinking about one's own thinking. More specifically, "metacognition is being aware of one's thinking as one performs specific tasks and then using this awareness to control what one is doing" (Jones & Ratcliff, 1993, p. 10).

The Importance of Critical Thinking

- Assures that conclusions are all relevant to the issue under consideration.
- Helps the thinker reach conclusions that are true to the purpose of consideration of the issue.
- Helps assure that relevant theories, definitions, axioms, laws, principles, or models underlying the issue are considered in their proper context.
- Reduces the likelihood of personal biases, prejudices, self-deception, distortion, misinformation, and so on being injected into the conclusion process.

- Assures that all relevant stakeholders' points of view are considered, including their concerns, goals, objectives, and intended outcomes.
- Considers all relevant evidence and excludes irrelevant evidence, including relevant and irrelevant data and experiences.
- Clarifies for the thinker what assumptions are being taken for granted and considers the relevance of those assumptions to the issue at hand.
- Considers the implications and possible consequences of various possible recommended courses of action.
- Helps the thinker infer conclusions from the evidence in the light of all other considerations listed above.

Elements of Critical Thinking Process

- Reflection.
- Analysis.
- Acquisition of information.
- Creativity.
- Structuring arguments.
- Decision making.
- Commitment.
- Debate.

There are nine Intellectual Standards we use to assess thinking:

- Clarity,
- Accuracy,
- Precision,
- Relevance,
- Depth,
- Breadth,
- Logic,
- Significance, and
- Fairness.

Principles of Critical Thinking

- Gather complete information.
- Understand and define all terms.
- Question the methods by which the facts are derived.
- Question the conclusions.
- Look for hidden assumptions and biases.
- Question the source of facts.
- Don't expect all of the answers.
- Examine the big picture.

Types of Critical Thinking

- There are **three** main **kinds of critical thinkers**:
- the naive **thinker**,
- the selfish **critical thinker**, and
- the fair-minded **critical thinker**.

Critical Thinking Skills

- The key critical thinking skills are:
  - analysis,
  - interpretation,
  - inference,
  - explanation,
  - self-regulation,
  - open-mindedness, and
  - problem-solving.

The Skills We Need for Critical Thinking

- The skills that we need in order to be able to think critically are varied and include observation, analysis, interpretation, reflection, evaluation, inference, explanation, problem solving, and decision making.
- Specifically we need to be able to:
- Think about a topic or issue in an objective and critical way.
- Identify the different arguments there are in relation to a particular issue.
- Evaluate a point of view to determine how strong or valid it is.
- Recognise any weaknesses or negative points that there are in the evidence or argument.
- Notice what implications there might be behind a statement or argument.
- Provide structured reasoning and support for an argument that we wish to make.

People with critical thinking skills can:

- Understand the links between ideas.
- Determine the importance and relevance of arguments and ideas.
- Recognise, build and appraise arguments.
- Identify inconsistencies and errors in reasoning.
- Approach problems in a consistent and systematic way.
- Reflect on the justification of their own assumptions, beliefs and values.

Six stages of Critical Thinking

- Stage One: The Unreflective Thinker.
- Stage Two: The Challenged Thinker.
- Stage Three: The Beginning Thinker.
- Stage Four: The Practicing Thinker.
- Stage Five: The Advanced Thinker.
- Stage Six: The Accomplished Thinker.

In the book, Critical Thinking, Beyer elaborately explains what he sees as essential aspects of critical thinking. These are:

- Dispositions: Critical thinkers are skeptical, open-minded, value fair-mindedness, respect evidence and reasoning, respect clarity and precision, look at different points of view, and will change positions when reason leads them to do so.
- Criteria: To think critically, must apply criteria. Need to have conditions that must be met for something to be judged as believable. Although the argument can be made that each subject area has different criteria, some standards apply to all subjects.

- Argument: Is a statement or proposition with supporting evidence. Critical thinking involves identifying, evaluating, and constructing arguments.
- Reasoning: The ability to infer a conclusion from one or multiple premises. To do so requires examining logical relationships among statements or data.
- Point of View: The way one views the world, which shapes one's construction of meaning. In a search for understanding, critical thinkers view phenomena from many different points of view.
- Procedures for Applying Criteria: Other types of thinking use a general procedure. Critical thinking makes use of many procedures. These procedures include asking questions, making judgments, and identifying assumptions.

Teaching Strategies to Help Promote Critical Thinking

- CATS (Classroom Assessment Techniques): It stresses the use of ongoing classroom assessment as a way to monitor and facilitate students' critical thinking. An example of a CAT is to ask students to write a "Minute Paper" responding to questions such as "What was the most important thing you learned in today's class? What question related to this session remains uppermost in your mind?" The teacher selects some of the papers and prepares responses for the next class meeting.

- Cooperative Learning Strategies: Cooper (1995) argues that putting students in group learning situations is the best way to foster critical thinking. "In properly structured cooperative learning environments, students perform more of the active, critical thinking with continuous support and feedback from other students and the teacher".

- Case Study /Discussion Method: McDade (1995) describes this method as the teacher presenting a case (or story) to the class without a conclusion. Using prepared questions, the teacher then leads students through a discussion, allowing students to construct a conclusion for the case.
- Using Questions: King (1995) identifies ways of using questions in the classroom:
- Reciprocal Peer Questioning: Following lecture, the teacher displays a list of question stems (such as, "What are the strengths and weaknesses of...). Students must write questions about the lecture material. In small groups, the students ask each other the questions. Then, the whole class discusses some of the questions from each small group.

- Reader's Questions: Require students to write questions on assigned reading and turn them in at the beginning of class. Select a few of the questions as the impetus for class discussion.

- Conference Style Learning: The teacher does not "teach" the class in the sense of lecturing. The teacher is a facilitator of a conference. Students must thoroughly read all required material before class. Assigned readings should be in the zone of proximal development. That is, readings should be able to be understood by students, but also challenging. The class consists of the students asking questions of each other and discussing these questions. The teacher does not remain passive, but rather, helps "direct and mold discussions by posing strategic questions and helping students build on each others' ideas" (Underwood & Wald, 1995).

- Use Writing Assignments: Wade sees the use of writing as fundamental to developing critical thinking skills. "With written assignments, an instructor can encourage the development of dialectic reasoning by requiring students to argue both [or more] sides of an issue" (p. 24).

- Dialogues: Robertsonand Rane-Szostak (1996) identify two methods of stimulating useful discussions in the classroom:

- Written dialogues: Give students written dialogues to analyze. In small groups, students must identify the different viewpoints of each participant in the dialogue. Must look for biases, presence or exclusion of important evidence, alternative interpretations, misstatement of facts, and errors in reasoning. Each group must decide which view is the most reasonable. After coming to a conclusion, each group acts out their dialogue and explains their analysis of it.

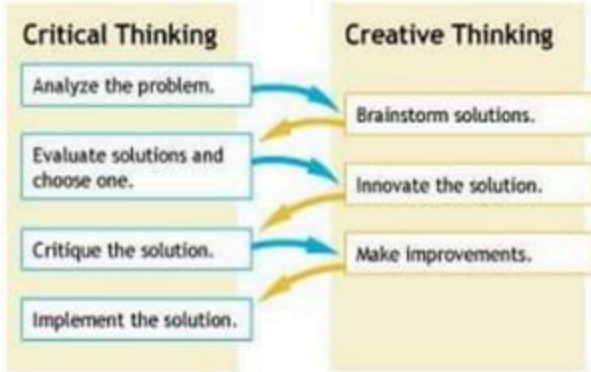
- Spontaneous Group Dialogue: One group of students are assigned roles to play in a discussion (such as leader, information giver, opinion seeker, and disagreer). Four observer groups are formed with the functions of determining what roles are being played by whom, identifying biases and errors in thinking, evaluating reasoning skills, and examining ethical implications of the content.
- Ambiguity: Strohm & Baukus advocate producing much ambiguity in the classroom. Don't give students clear cut material. Give them conflicting information that they must think their way through.

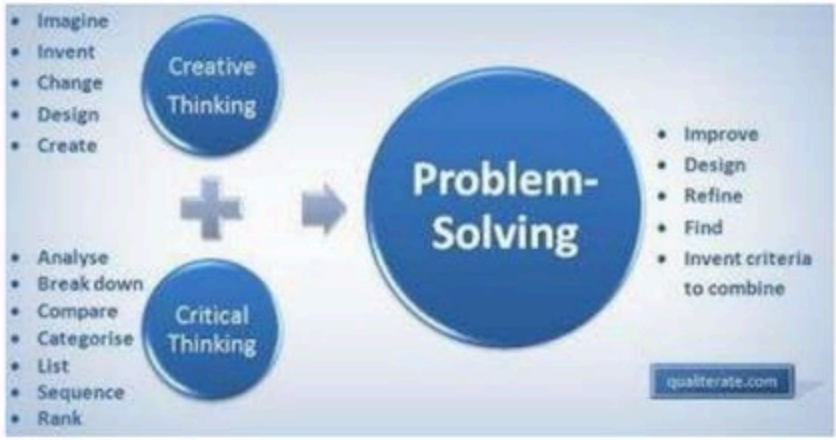
Critical Thinking Barriers

1. Egocentric Thinking
2. Groupthink
3. Drone Mentality
4. Social Conditioning
5. Biased Experiences
6. Schedule Pressures
7. Arrogance and Intolerance

- Critical thinking is aimed at achieving the best possible outcomes in any situation. In order to achieve this it must involve gathering and evaluating information from as many different sources possible.
- Critical thinking requires a clear, often uncomfortable, assessment of your personal strengths, weaknesses and preferences and their possible impact on decisions you may make.
- Critical thinking requires the development and use of foresight as far as this is possible. As Doris Day sang, "the future's not ours to see".
- Implementing the decisions made arising from critical thinking must take into account an assessment of possible outcomes and ways of avoiding potentially negative outcomes, or at least lessening their impact.
- Critical thinking involves reviewing the results of the application of decisions made and implementing change where possible.

Critical Thinking	Creative Thinking
Analytical	Generative
Convergent	Divergent
Left brain	Right brain
Logical	Intuitive
Sequential	Imaginative
Objective	Subjective
Reasoning	Speculating
Reality Based	Fantasy Based
Vertical	Lateral
Probability	Possibility
Judgmental	Non-judgmental
Verbal	Visual
Hypothesis testing	Hypothesis forming
Closed-ended	Open-ended
Pattern Users	Pattern Seekers




Imagine
Invent
Change
Design
Create
Creative Thinking
Analyse
Break down
Compare
Categorise
List
Sequence
Rank
Critical Thinking
Problem-Solving
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