Critical Thinking

Getting Beyond the Irrelevant, Erroneous, Fallacious, Ambiguous, Unsubstantiated, or Just Plain Fundamentally Confused

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August 2010
At the end of this presentation you will ..........

- Be a better person True/False
- Understand your career path True/False
- Comprehend how to get straight A’s True/False
- Learn the basics of public health True/False
- See clearly why you’ve chosen to get a Masters in Public Health True/False
Cohesion – Unifying the Parts
Gestalt

**Gestalt** Principles - the whole is greater than the sum of the parts. In other words we really perceive more than what our eyes actually are seeing. Our brains fill in the rest of the meaning for us.

- **Figure Ground** - In order to perceive an object correctly our brains must distinguish between an object and its background. Our perception is based on this decision.
- **Similarity** - we group things that are similar by color, shape, etc. into a single unit and see them as belonging together or similar.
- **Proximity** - we perceive things as a unit depending on the relative distance between them.
- **Continuity** - We group things into a single unit if they appear to form a continuous pattern.
- **Closure** - We tend to complete the missing elements of an object as we perceive it filling in what we expect to be there.
- **Simplicity** - We choose the simplest explanation for any object or stimulus that we observe.
What Do You See?
The Hering Illusion

- The Hering illusion is an optical illusion discovered by the German physiologist Ewald Hering in 1861. The two horizontal lines are both straight, however they look as if they are bowed outwards. The distortion is produced by the lined pattern on the background that simulates a perspective design, and creates a false impression of depth. Note that the thinner line appears more bowed than the thicker line.
Perceptual Illusion

- In the previous figure, if you stared at the center of the figure for a while….
- Some activity will build up in the violet and blue rings (annuli).
- Some observers also report a circular rotation within these regions.
Indonesian Urban Landscape - Wastewater
The Built Environment and Health
Developmental pressures, urban migration, environmental management, inadequate urban housing, access to health care, health disparities, cultural beliefs about healing, quality of life, kinship networks and social support.
Food Vendor
Processing Information – A Few Easy Lessons

- When I’m feeling overloaded with new information I often ..... 
- When I don’t have enough time to study the assigned reading I usually .... 
- Before a big test, my personal study strategy could be described as ....
Active vs Passive Learning

- Studies have shown that students who passively sit and listen to lectures remember about 10% at the end of the lecture.
- Students who actively engage mentally and physically will remember about 40%.
- So, based on these studies about learning, if we simply lecture on 100 items, it is possible that you will remember 10 of them.
Recognizing vs Knowing

- So, let’s consider the possibility that you remember 10 things from lecture. What have we achieved?
- Recognition is not understanding. It is merely the first step. In the cycle of learning, recognition is part of the “transition between Unconscious and Conscious Incompetence.”*
- (*This (word recognition) is often the strategy used to take multiple choice exams – students may use their recognition of words to make decisions/choices among answer options. Understanding of the concepts may not be present.)
Projected Forgetting Curve – Reading, Listening, Discussing, Applying, Reviewing, Chewing, Digesting

Storage Needs to Be Reinforced Over Time
Random Storage

- What if you make the mistake of memorizing what you think you need to know as discreet facts?
- What if you try to remember material long enough to take an exam or a quiz?
- How much real knowledge have you achieved?
- One professor calls this “bulimic learning.” (Binging and purging)
Information Overload – Creating a Mental Map Through The Content Maze
Information Retention

- Working memory has a limited capacity.
- People can optimally retain only 7 (± 2) discrete new pieces of information at a time.
- This is why telephone numbers are 7 digits in length.
What Is Your Learning Style?

Getting your bearings in a sea of information ……
- **Visual Learners:**
  - *learn through seeing*...
  - These learners need to see the teacher's body language and facial expression to fully understand the content of a lesson. They tend to prefer sitting at the front of the classroom to avoid visual obstructions (e.g. people's heads). They may think in pictures and learn best from visual displays including: diagrams, illustrated text books, overhead transparencies, videos, flipcharts and hand-outs. During a lecture or classroom discussion, visual learners often prefer to take detailed notes to absorb the information.

- **Auditory Learners:**
  - *learn through listening*...
  - They learn best through verbal lectures, discussions, talking things through and listening to what others have to say. Auditory learners interpret the underlying meanings of speech through listening to tone of voice, pitch, speed and other nuances. Written information may have little meaning until it is heard. These learners often benefit from reading text aloud and using a tape recorder.

- **Tactile/Kinesthetic Learners:**
  - *learn through, moving, doing and touching*...
  - Tactile/Kinesthetic persons learn best through a hands-on approach, actively exploring the physical world around them. They may find it hard to sit still for long periods and may become distracted by their need for activity and exploration.
Ask Questions -

- Learn to ask **powerful** questions –
  - Question the general status quo
  - Identify questions that penetrate masks, propaganda, myths, points of view, unfounded opinion, cultural bias
  - Discover through inquiry

- Good thinkers routinely ask questions in order to understand and effectively deal with the world around them.”
  - From Becoming A Critic Of Your Thinking by Dr. Linda Elder & Dr. Richard Paul

- Consider the following:

  - Which part of these topics do I need to know?
  - What material in the reading do I need to study to do well on the exam?
  - Will these lecture points be on the exam?
Evaluate Information Sources

- Does the information source have the necessary qualifications or level of understanding to make the claim (or conclusion)?
- Does the source have a reputation for accuracy?
- Does the source have a motive for being inaccurate or overly biased?
- Are there any reasons for questioning the honesty or integrity of the source?

From A Practical Guide to Critical Thinking
- by Greg R. Haskins
In the Following List of Individuals …
Which One is Best Qualified to ….

- A person with a high school diploma.
- A person with an associate degree from a community college.
- A person with a bachelor’s degree from an online “degree mill.”
- A person with a Ph.D. from an Ivy League University.

- A. Raise a healthy child
- B. Exercise their right to vote in an intelligent manner
- C. Become a change agent and activist for improvements in patient care.
Who Would You Rather Have Doing Your Father’s Heart Surgery?

- A male physician who graduated from medical school in 1962.
- A 40 year old female physician who has a good clinical record but is going through a contentious divorce.
- A 45 year old male physician who is highly esteemed by other doctors but has a drinking problem with alcohol.
Becoming Better Thinkers or
How to Achieve Unengaged Learning

- Fail to think through implications
- Focus on the trivial
- Ask vague questions
- Give vague answers
- Distort data and state it inaccurately
- Misuse words
- Miss key ideas
- Use irrelevant ideas
- Confuse issues of different types
- Come to conclusions based on inaccurate or irrelevant information
- Make unjustified assumptions
Critical Questions You Can Ask If You’re Stumped for Intelligent Questions

- What is the purpose, goal, or point?
- What is the problem or issue being solved or described?
- On what data or evidence is the decision / definition / problem based?
- What are the biases or assumptions behind the inferences, selection or collection of data, or framing of the problem / experiment?
- What are the basic concepts or terms being used? How do these definitions affect the framing / understanding of the problem?
- What inferences are being made from what kind of data, and are these inferences legitimate?
- What point of view is being expressed? What political / ideological / paradigmatic considerations inform or govern or limit the point of view?
- What is the solution, outcome, or resolution of the problem or issue?
- What are the short-term and long-term implications of the solution / consequences of the outcome?
- How would someone from a related but different discipline look at the problem / solution / issue, and could an interdisciplinary approach improve the analysis / discussion / evaluation?
Listening Skills
Hints for *Looking* Intelligent

- Pay careful attention – Be actively listening
- Lean forward as you listen
- Take notes
- Be receptive
- Attend to body language and non verbal cues of group members, yourself, and your professor
- Listen without being judgmental
- Listen with enthusiasm and energy
- Listen with a discerning mind
Open - Mindedness

- Be willing to take relevant evidence into account in forming or revising your thinking or understanding.
- Be critically receptive.
Beware the Hazards of .... Book Learning
Bloom’s Taxonomy of Learning

- Knowledge - Exhibit memory of previously-learned materials by recalling facts, terms, basic concepts and answers. (1)

- Comprehension – Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas. (2)

- Application - Using new knowledge. Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way (3)

- Analysis - Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations (4)

- Synthesis - Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions (5)

- Evaluation - Present and defend opinions by making judgments about information, validity of ideas or quality of work based on a set of criteria (6)
Analysis and Synthesis
Inductive & Deductive Reasoning

- **Inductive reasoning** goes from the specific to the general. The process of making inferences based upon observed patterns, or simple repetition. Often used in reference to predictions about what *will happen* or *does happen*, based upon what *has happened*.

- **Deductive reasoning** goes from the general to the specific.

- **Deductive reasoning** starts with a general rule, a premise, which we know to be true, or we accept it to be true for the circumstances. Then from that rule, we make a conclusion about something specific.

- Inductive reasoning is making a conclusion based on a set of **empirical data**. If I observe that something is true many times, concluding that it will be true in all instances, this is an example of inductive reasoning. Example:
  - All sheep that I've seen are white
  - All sheep must be white
  - This example makes inductive reasoning seem useless, but it is in fact very powerful. Most scientific discoveries are made with use of inductive reasoning.
Guide to Rating Critical & Integrative Thinking
Developed by Washington State University
Self Rating — Instruction: on each of the seven criteria on the handout, assess your own skills and abilities. Rate each one on a scale of 1 through 6. Note that a score of 4 represents competency for a student completing their *undergraduate* studies at this University.

- 1. Identifies, summarizes (and appropriately reformulates) the problem, question or issue.
- 2. Identifies and considers the influence of context and assumptions.
- 3. Develops, presents, and communicates one’s own perspective, hypothesis or position.
- 4. Presents, assesses, and analyzes appropriate supporting data/evidence.
- 5. Integrates issues using other disciplines’ perspectives and positions.
- 6. Identifies and assesses conclusions, implications, and consequences.
- 7. Communicates effectively.