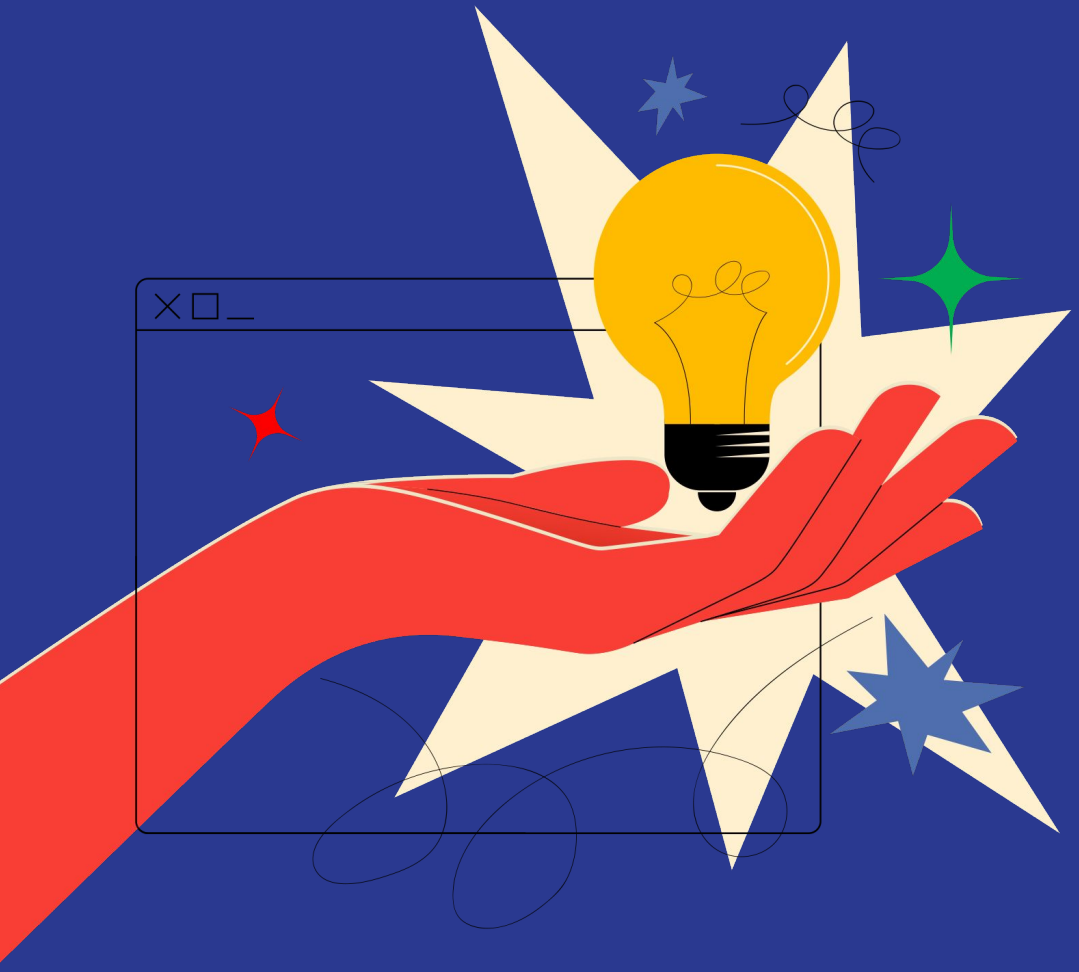

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First steps as critical thinkers

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with the support of webPACT
Grupo do Pensamento Crítico e Criativo da UTAD

Let us know each other a little better ...

Veronika Joukes

Tourism

Maria Nascimento

Didactics of Statistics & Mathematics

slido

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I'm ...

ⓘ Start presenting to display the poll results on this slide.

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My main research area is ...

ⓘ Start presenting to display the poll results on this slide.

Image retrieved from https://accion.com.br/gerenciador-de-compras-o-ponto-de-partida

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Use one word to express what is critical thinking for you.

ⓘ Start presenting to display the poll results on this slide.

At the end of this 1st session you should be able to:

- Understand the importance of critical thinking in your daily life and as a researcher;
- Understand critical thinking definitions;
- Identify the characteristics of a scientific critical thinker;
- Identify Paul and Elder guidelines for analysis and research.

CRITICAL THINKING

KRITIKOS “ability to make judgments”

KRINEIN “separate, decide, judge”

KRISIS “judgment, selection”

KREI “to sift, to discriminate, to distinguish”

CRITICAL THINKING

PENSARE

“hanging to assess the weight of an object”

PENDERE

“to hang, to weigh”

“to weigh” the different arguments or facts to reach a conclusion.

Critical thinker?

Let us question our thinking

slido

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Maria is 31, single, and very intelligent. She has a degree in Philosophy and has always been deeply concerned with issues of discrimination and social justice, and has participated in several anti-nuclear demonstrations. Which is the most likely:

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Heuristics and cognitive biases

- **Heuristics** are mental shortcuts that can facilitate problem-solving and probability judgements.

  https://thedecisionlab.com/biases/heuristics

  - These strategies are generalizations, or rules-of-thumb, reduce cognitive load, and can be effective for making immediate judgements. However, they often result in irrational or inaccurate conclusions.

- A **cognitive bias** is a systematic error in thinking that occurs when people are processing and interpreting information in the world around them and affects the decisions and judgments that they make.

  https://www.verywellmind.com/what-is-a-cognitive-bias-2794963

Heuristics examples

- E.g., ***the availability heuristic*** occurs because we can call certain memories to mind more easily than others.
  - E.g., Kahneman and Tversky (1979): asked the participants if more words in the English language start with the letter R or have the 3rd letter R, most participants responded with the former.
    - As a matter of fact, it is the latter that is true, but it is much harder to think of words that have R as the third letter than it is to think of words that start with R.
    - Our memories of words that begin with R come to mind more readily than do memories of words with the third letter R.

https://thedecisionlab.com/biases/heuristics

• Cognitive bias examples

- E.g., the tendency to combine or compare research studies from the same source, or from sources that use the same methodologies or data.
- E.g., the tendency to insufficiently revise one's belief when presented with new evidence.
- E.g., the tendency limiting a person to use an object only in the traditional way. An over-reliance on a familiar tool or method, ignoring or under-valuing alternative approaches.

"If all you have is a hammer, everything looks like a nail."

https://en.wikipedia.org/wiki/List_of_cognitive_biases or https://thedecisionlab.com/biases

DEFINITIONS

involve argumentation and criteria

«Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it, and the further conclusions to which it tends.» John Dewey (1910) *How We Think*.

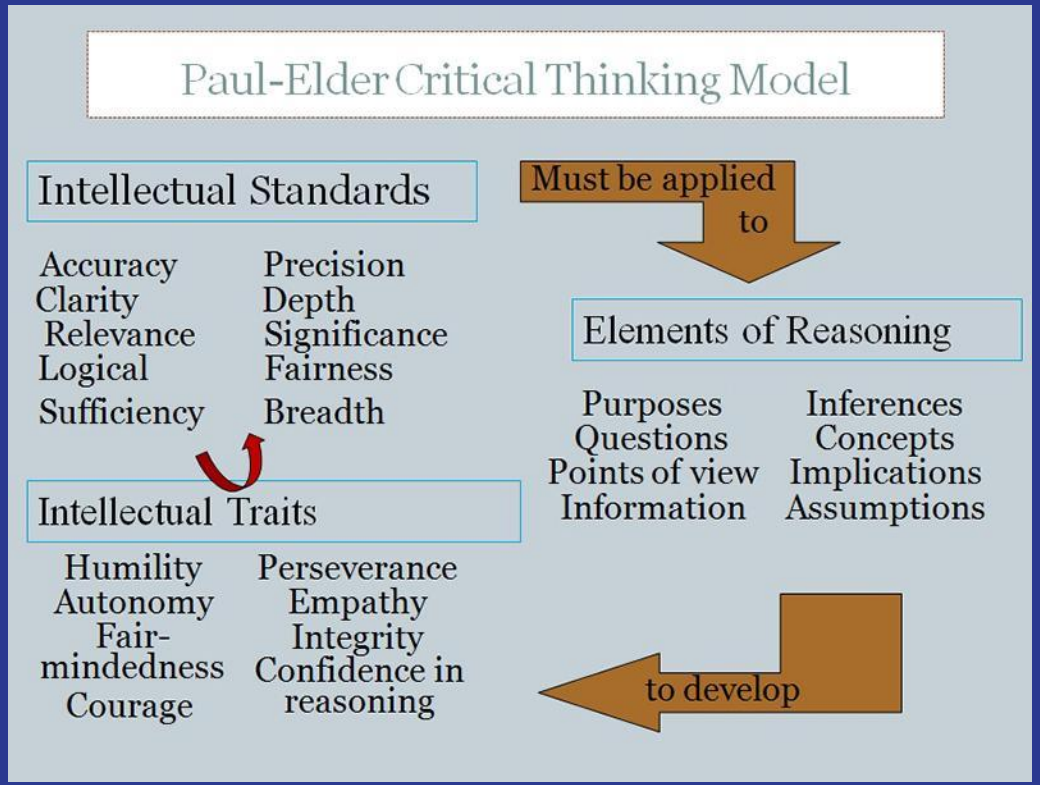
«Rational, reflective thinking focused on deciding what to do or what to believe.» Robert H. Ennis, 1996, *Critical Thinking*

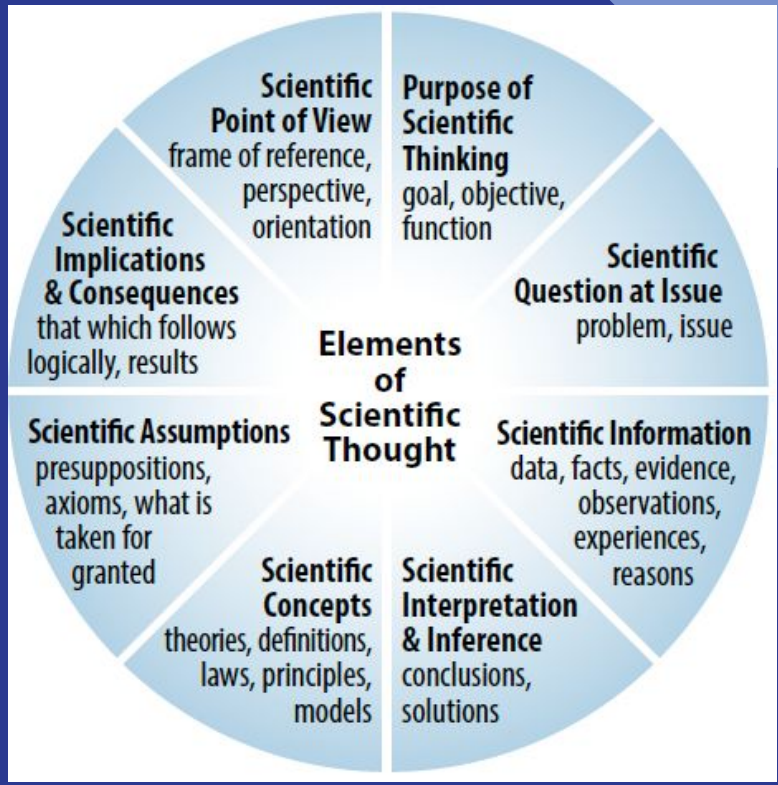
«Critical thinking is that way of thinking ... in which the thinker improves the quality of his thinking by taking account of the inherent structures of thought and imposing intellectual standards on it.» Richard Paul, 2002, *Critical Thinking, tools for taking charge of your professional and personal life.*

Other definitions of critical thinking

- **Bloom (1956)** – higher-order thinking, which involves more cognitive processing than simply learning facts or concepts (creating new knowledge).
- **Facione (2011)** – intentional and self-regulated insight that includes a combination of attitudes, knowledge, and skills.
- **Halpern (2014)** – (…) that increases the possibility of a desirable outcome.
- **Barnett (2015)** – incorporates not only argumentation, judgement, and reflection, but also the individual's identity and participation in the world.
- **Battersby & Bailin (2015)** – involves the careful analysis of a topic/matter in order to reach an informed judgment (*critical inquiry*).
- **Saiz (2017)** – obtaining the best explanation for a fact, phenomenon, or problem, with a view to its effective resolution.

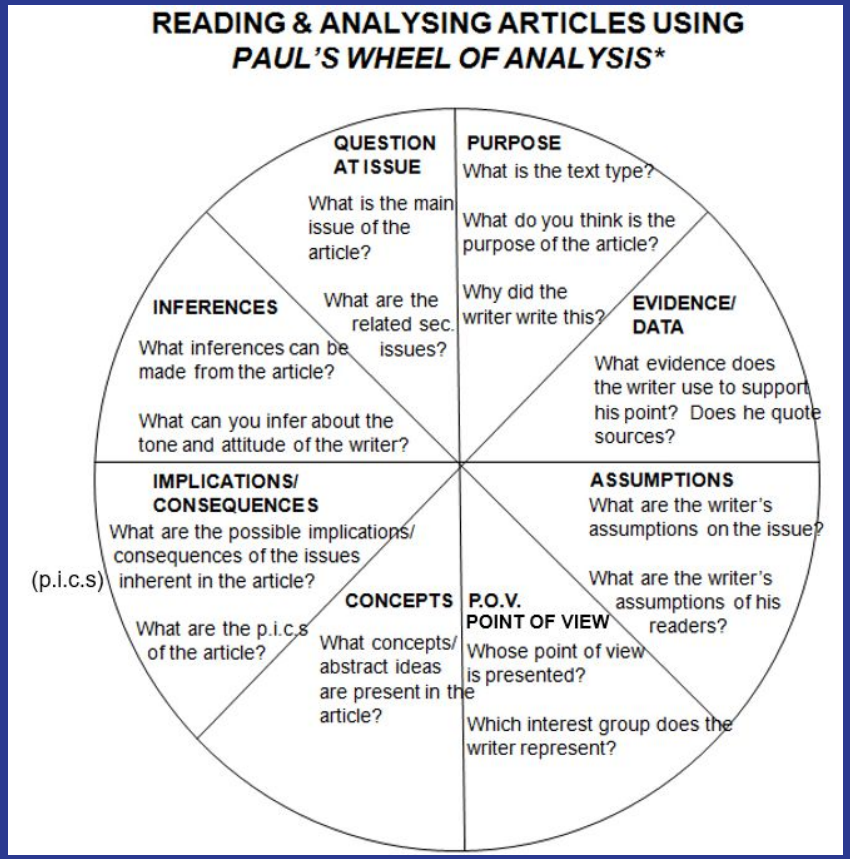
Paul & Elder guidelines (2001, 2006, 2015)*

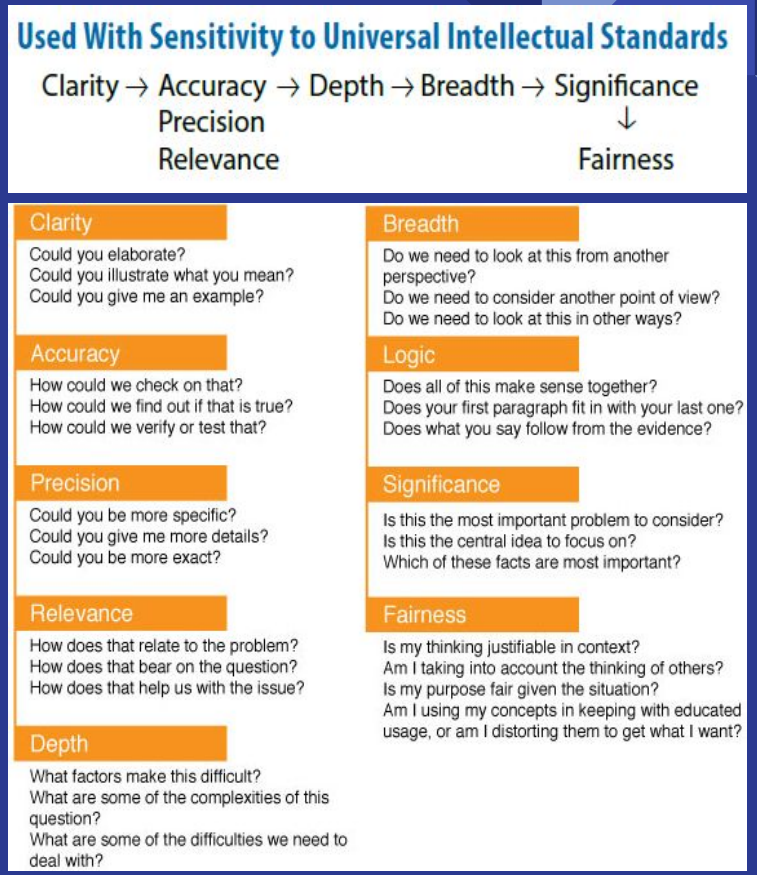




*Adapted from *The Thinker's Guide to Scientific Thought*, p. 4, www.criticalthinking.org

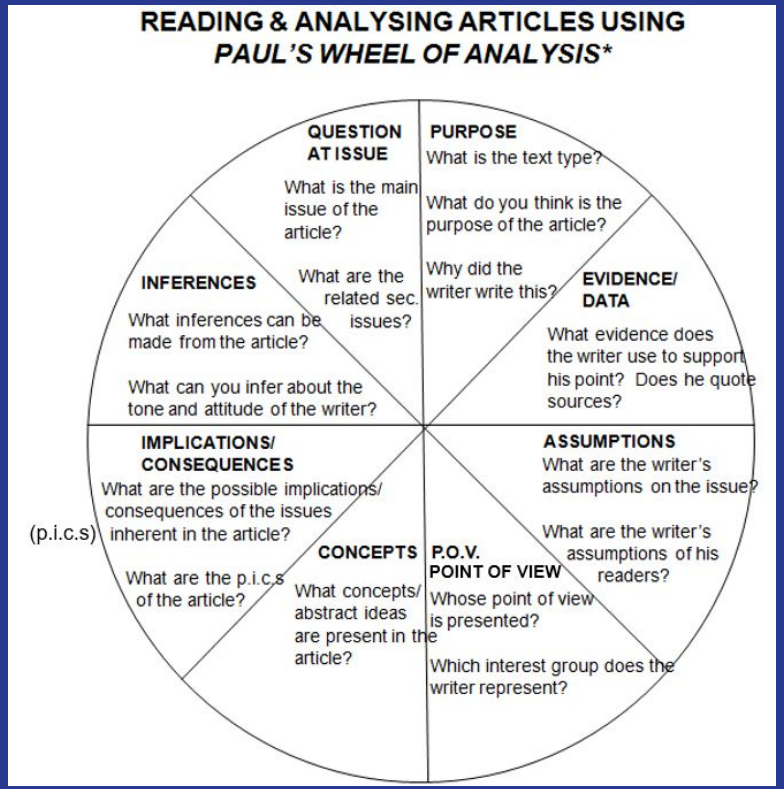
Reading and analysing an article using Paul's wheel of analysis





www.criticalthinking.org and https://www.designorate.com/wp-content/uploads/2017/06/intellectual_standards.jpg

Using Paul's wheel of analysis for a research scenario



The Critical Thinking Questioning Rubric*

Stages/dimensions	Guiding questions
1 – Problem definition	What exactly is the problem at hand? What are its dimensions, causes, consequences, etc.? This stage involves studying the context of the problem, how it arose, what consequences and dimensions it can assume and, basically, all aspects that will allow us to formulate and specify it.
2 – Beliefs and values	What beliefs and values do we have about this problem? It involves all the facts and information that we take for granted regarding the problem at hand.
3 – Questions	What questions and sub-questions emerge from the problem? It involves formulating questions to help us better understand the problem and study possible solutions. What? How? Where? When? Why? What if...?
4 – Information	What relevant information do we need to answer the questions and the problem? Are they credible and can we use them? It involves the search and analysis of information that will help us answer the questions and to build our sustained perspective on the problem.
5 - Solutions	What different solutions can be adopted to solve the problem and what are the main arguments that support them? It involves analyzing the different perspectives about the problem, assessing their assumptions, conclusions, and implications.
6 – Our solution	What is our solution and its implications? It involves the proposal of a perspective based on the whole analysis of the problem carried out in the previous steps, as well as the recognition of its implications.
7 – Objections to our solution	What are the weaknesses of our solution? It involves identifying possible objections to the solution presented, as well as weighing up their added value compared to such objections.

www.criticalthinking.org and available: https://www.criticalthinking.org/ctmodel/logic-model1.htm

Thank you!

Let us experience how challenging it is to be a critical thinker during ***the workshop ...***

Veronika Joukes

Tourism

Maria Nascimento

Didactics of Statistics & Mathematics

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