Critical Thinking in the Age of Artificial Intelligence

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A Guide to Reason and Writing at Fanshawe College

GERMÁN GUTIÉRREZ-SANIN

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Contents

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This project was a collaboration between the contributors and the team in the OER Design Studio at Fanshawe. The following faculty and support staff were involved in the creation of this project:

- Andrew Stracuzzi, *Instructional Design and Quality Assurance*
- Shauna Roch, *OER Project Lead*
- Jason Benoit, *Developer*
- Wilson Poulter, *Copyright Officer*

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Preface

Dear Reader

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We are living in a time of extraordinary technological advancement, where **artificial intelligence** is rapidly transforming how we interact with others, work, and create. While AI offers vast possibilities, it also presents serious challenges. Challenges that test the strength of human ingenuity, independence, and intellectual depth. In this swiftly changing environment, the full development of our **natural human intelligence** has never been more critical.

Our globalized surroundings are filled with never-before-encountered amounts of information, competing perspectives, and complex problems, where critical thinking stands out as an indispensable skill for the very survival of humanity. It is the key to producing sound judgments, crafting compelling arguments, and engaging meaningfully with the world around us. This book is not merely a collection of concepts and exercises, it is an invitation to think deeply, to question boldly, and to refine your ability to analyze and create ideas, concepts and arguments with clarity and precision.

Whether you are a student navigating academic challenges, a professional making a fundamental decision that shapes your work, or a lifelong learner seeking to sharpen your reasoning, the skills in this workbook will empower you.

Through structured lessons, practical exercises, and thought-provoking challenges, you will explore the elements of thought, the standards of reasoning, and the art of constructing and deconstructing arguments.

Critical thinking is not just a skill—it is the foundation of true intellectual freedom. It is the ability to question, analyze, and innovate beyond pre-programmed responses or algorithmic predictions. Unlike artificial intelligence, human intelligence is fueled by curiosity, shaped by lived experiences, and refined through creative problem-solving. The ability to think critically is what enables progress, fuels discovery, and ensures that human perspectives remain at the heart of decision-making.

Critical thinking is not about knowing all the answers. It is about asking better questions. It is about learning to recognize biases, assess evidence with discernment, and develop the intellectual courage required to revise your perspectives when necessary.

This book is an invitation to reclaim, refine, and strengthen your ability to think independently. It is designed to sharpen your reasoning, challenge assumptions, and empower you to evaluate information with clarity and precision. In a world where automation can replicate patterns but cannot originate wisdom, it is essential that we continue to nurture the bold, imaginative, and discerning minds that define what it means to be human.

Artificial intelligence can simulate reasoning, but it cannot truly understand. It cannot create from lived experience, nor can it challenge the status quo without a rational human direction. That power—the power of initiative, creativity, and originality—belongs to us alone. And through this book, you will embark on a journey

to develop not only strong arguments and sharp analytical skills but also a confident and independent mind capable of shaping the future.

Here at Fanshawe College, we are committed to deep thinking, courageous questioning, and unyielding intellectual growth. The world needs minds that lead, not simply follow.

Let’s begin the journey.

Germán Gutiérrez-Sanin

CHAPTER 1: AN INTRODUCTION TO CRITICAL THINKING

Chapter Overview

1.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Define key concepts in classical logic, including syllogisms and their structure.
2. Identify the most frequently used syllogisms found in critical argumentation.
3. Explain how historical figures like Socrates and Aristotle contributed to the development of logical reasoning.
4. Describe the most common logical fallacies that appear in routine argumentation.
5. Analyze recent historical events to evaluate how fallacious reasoning has influenced public perception and decision-making.
6. Apply logical reasoning to evaluate arguments in academic, professional, and civic contexts.

1.1 What is Critical Thinking?

Critical thinking is the ability to think clearly and rationally about what to do or what to believe. 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.

"Mind. Brain. Mindset" by John Hain. Pixabay License

Critical thinking is not simply 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. Critical thinkers are able to deduce consequences from what they know, make use of information to solve problems, and seek relevant sources of information to inform themselves.

The Importance of Critical Thinking

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 also use critical thinking to enhance work processes and improve social institutions.

Consider some of the following additional benefits of possessing solid critical thinking skills:

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 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 analyze 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 analyze the logical structure of texts, critical thinking also improves comprehension abilities.

Critical thinking promotes creativity.

Some people believe that critical thinking hinders creativity because critical thinking requires following the rules of logic and rationality, whereas creativity might require breaking those rules. This is a misconception. Critical thinking is quite compatible with thinking "out-of-the-box," challenging consensus views, and pursuing less popular approaches. If anything, critical thinking is an essential part of creativity because we need critical thinking to evaluate and improve our creative ideas.

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.

Good critical thinking is the foundation of science and democracy.

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.

Critical thinking is a metacognitive skill.

What this means is that it is a higher-level cognitive skill that involves thinking about thinking. We have to be aware of the good principles of reasoning, and be reflective about our own reasoning. In addition, we often need to make a conscious effort to improve ourselves, avoid biases, and maintain objectivity. This is notoriously hard to do. We are all able to think but to think well often requires a long period of training. The mastery of critical thinking is similar to the mastery of many other skills. There are three important components: theory, practice, and attitude.

Improving Our Thinking Skills

Theory

If we want to think correctly, we need to follow the correct rules of reasoning. Knowledge of theory includes knowledge of these rules. These are the basic principles of critical thinking, such as the laws of logic, and the methods of scientific reasoning, etc.

Also, it would be useful to know something about what not to do if we want to reason correctly. This means we should have some basic knowledge of the mistakes that people make. First, this requires some knowledge of typical fallacies. Second, psychologists have discovered persistent biases and limitations in human reasoning. An awareness of these empirical findings will alert us to potential problems.

Practice

However, merely knowing the principles that distinguish good and bad reasoning is not enough. We might study in the classroom about how to swim, and learn about the basic theory, such as the fact that one should not breathe underwater. But unless we can apply such theoretical knowledge through constant practice, we might not actually be able to swim.

Similarly, to be good at critical thinking skills, it is necessary to internalize the theoretical principles so that we can actually apply them in daily life. There are at least two ways to do this. One is to perform lots of quality exercises. These exercises don't just include practicing in the classroom or receiving tutorials; they also include engaging in discussions and debates with other people in our daily lives, where the principles of critical thinking can be applied. The second method is to think more deeply about the principles that we have acquired. In the human mind, memory and understanding are acquired through making connections between ideas.

Attitudes

Good critical thinking skills require more than just knowledge and practice. Persistent practice can bring about improvements only if one has the right kind of motivation and attitude. The following attitudes are not uncommon, but they are obstacles to critical thinking:

- I prefer being given the correct answers rather than figuring them out myself.
- I don't like to think a lot about my decisions as I rely only on gut feelings.
- I don't usually review the mistakes I have made.
- I don't like to be criticized.

To improve our thinking, we have to recognize the importance of reflecting on the reasons for belief and action. We should also be willing to engage in debate, break old habits, and deal with linguistic complexities and abstract concepts.

Critical thinking is concerned not with what you believe, but rather how or why you believe it. Most classes, such as those on biology or chemistry, teach you what to believe about a subject matter. In contrast, critical thinking is not particularly interested in what the world is, in fact, like. Rather, critical thinking will teach you how to form beliefs and how to think. It is interested in the type of reasoning you use when you form your beliefs, and it concerns itself with whether you have good reasons to believe what you believe.

Let's Watch

What is Critical Thinking (and Why Should I Care)?

Video: "What is Critical Thinking (and Why Should I Care)?" by Sage Students [4:10] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

As writers, it is essential to understand the role of critical thinking—not only for success in college, but also as a foundation for effective communication in future careers. Critical thinking equips you to analyze ideas, evaluate evidence, and construct well-reasoned arguments. With a basic understanding of its purpose, we can now turn our attention to the formal structures of argumentation that can strengthen your writing. A key starting point is recognizing how logic functions in the critical assessment of ideas, helping you build arguments that are clear, coherent, and persuasive.

1.2 The Importance of Logic

What we refer to as “Critical Thinking” is the application of Logic to the formulation of thoughts, ideas and observations. Logical thinking has evolved over thousands of years, shaping the way we reason and the manner in which we analyze arguments. The origins of logic can be traced back to ancient civilizations, including the works of Babylonian and Egyptian mathematicians. However, it was in ancient Greece that logic truly flourished. Aristotle played a pivotal role in formalizing logical principles by introducing syllogisms.

A **syllogism** is a form of deductive reasoning that consists of three parts: a major premise, a minor premise, and a conclusion. If the premises are true and logically structured, the conclusion must also be true. Here are a few examples:

Major premise: All mammals are animals
Minor Premise: All rabbits are mammals
Conclusion: All rabbits are animals

And, in fact, we can also say:

Major premise: All mammals are animals
Minor Premise: All humans are mammals
Conclusion: All humans are animals

Do we have to be careful? Of course we do. There are different categories of syllogisms. They are an invitation to deeper contemplation and thought.

Common Syllogisms

These are the most frequent syllogisms:

Categorical Syllogism: It is based on categories that follow the structure: "If A is part of C, then B is part of C". Here is an example used in programming logic:

- Major premise: All valid algorithms follow logical rules.
- Minor premise: This computer model program we are working on follows logical rules.
- Conclusion: Therefore, this model is a valid algorithm[1].

Conditional (Hypothetical) Syllogism: "If A is true, then B is true" pattern. Here is an example used in scientific reasoning:

- Major premise: If a substance reacts with acid, then it is a base.
- Minor premise: This substance reacts with acid.
- Conclusion: Therefore, this substance is a base.

And another example when it is used for political debate:

- Major premise: If a policy benefits the majority, then it should be implemented.
- Minor premise: This policy benefits the majority.
- Conclusion: Therefore, this policy should be implemented.

Disjunctive Syllogism: "Either A or B is true; if A is false, then B must be true" pattern. Here is an example used in ethical reasoning:

- Major premise: Either an action is morally right or morally wrong.
- Minor premise: This action is not morally wrong.
- Conclusion: Therefore, this action is morally right.

Universal Syllogism: Uses absolute terms like "all" or "none". Used for metaphysical debates:

- Major premise: All humans seek meaning in life.
- Minor premise: Socrates was a human.
- Conclusion: Therefore, Socrates sought meaning in life.

Particular Syllogism: Uses terms like "some" or "most" instead of absolutes. Used in legal reasoning:

- Major premise: Some contracts require written consent.
- Minor premise: This contract does not have written consent.
- Conclusion: Therefore, this contract may not be legally binding.

1. "An algorithm is a set of steps for accomplishing a task or solving a problem. Typically, algorithms are executed

Syllogisms do play a crucial role in legal reasoning, helping judges, lawyers, and scholars structure arguments logically. In legal frameworks, a legal syllogism follows a deductive structure:

- Major premise – A general legal rule or principle.
- Minor premise – The specific facts of a case.
- Conclusion – The legal judgment or decision.

In Judicial Decisions, courts use syllogisms to apply laws to cases. For example:

- Major premise: Theft is punishable by law.
- Minor premise: The defendant stole property.
- Conclusion: The defendant is guilty of theft.

Legislators and legal scholars use syllogisms to analyze laws and determine their applicability, and lawyers construct syllogistic arguments to persuade judges and juries by demonstrating logical consistency in their arguments.

However, while syllogisms are used to provide clarity, some legal scholars argue that the idea that legal decisions can always be justified through strict deductive reasoning oversimplifies complex cases. *Legal interpretation often requires a deeper context, greater analysis of precedent, and more detailed moral reasoning*, which syllogisms alone may not fully capture.

Logic: A Brief Overview

Let's go back to our introduction to Logic. Socrates played a crucial role in shaping logical thinking through his Socratic method, a form of inquiry that uses systematic questioning to expose contradictions and refine ideas. His approach emphasized critical thinking, dialogue, and self-examination, laying the groundwork for Plato's dialectical reasoning and influencing Aristotle's formal logic.

"The Death of Socrates" by Jacques-Louis David, Public Domain.

Socrates believed that true wisdom comes from recognizing one's ignorance, which encouraged deeper intellectual inquiry. His unrelenting examination of assumptions helped develop *rigorous argumentation*, which is the *essential foundation of logical reasoning*. The influence of Socrates extended beyond philosophy, shaping education, law, and ethics, where structured debate and logical analysis remain essential to this day.

by computers, but we also rely on algorithms in our daily lives. Each time we follow a particular step-by-step process, like making coffee in the morning or tying our shoelaces, we are in fact following an algorithm.In the context of computer science, an algorithm is a mathematical process for solving a problem using a finite number of steps. Algorithms are a key component of any computer program and are the driving force behind various systems and applications, such as navigation systems, search engines, and music streaming services." (Nikolopoulou, 2023)

Later, during the Middle Ages, scholars refined Aristotelian logic, developing new methods of *categorization* and *inference*. The Renaissance and Enlightenment periods challenged traditional logic, leading to advancements in reasoning techniques. By the 19th and 20th centuries, logic underwent a revolution with the introduction of symbolic notation and mathematical methods, and today, logic extends beyond philosophy into fields like computer science, artificial intelligence, and decision-making, influencing how we structure arguments and analyze information.

The Socratic Method, which relies on systematic questioning, has influenced modern logic by encouraging structured argumentation and identifying contradictions or flaws in the premises of critical thinking. These flaws are called Fallacies. These flaws, or "defective", "uninformed", or otherwise illogical ideas, usually appear in the form of statements uttered or written by an author, who pretends to influence the reader's perception, feelings or ideas about a specific problem, impose a possible solution, or "sell" a course of action to their audience. Sometimes the fallacies are born of ignorance on the part of the writer who presents a piece of reasoning about something, but on many occasions, they are expressed with the intent of wrongful manipulation and purposeful deception on the part of the author.

1.3 Understanding Fallacies of Argumentation

Let's engage in the descriptions of these main "defective" premises that can lead manipulators to manipulate and the manipulated audiences to be manipulated. Below is a list of the 14 most common types of fallacies you'll encounter as a writer:

Hasty Generalization | Post Hoc (False Cause) | Red Herring | Bandwagon Appeal | Straw Man | Ad Hominem | Either/Or (False Dilemma) | Appeal to Authority | Appeal to Pity | Appeal to Force | Begging the Question | Non Sequitur | False Analogy | Circular Argument

1. Hasty Generalization

Explanation: This fallacy occurs when someone makes a broad statement based on insufficient evidence. It often stems from limited data or a single experience.

Example: A student fails one history quiz and immediately claims, "I'm horrible at history and will never understand it."

Now ask yourself, "Is this conclusion based on enough evidence?"

2. Post Hoc (False Cause)

Explanation: This fallacy assumes that just because one event occurred before another, the first event must have caused the second.

Example: A student wears a certain pair of shoes while getting an A on their science test. They decide those shoes are their "lucky shoes" and must be worn during exams.

Now let's think of alternative explanations for a supposed cause-and-effect relationship and identify the elements of true causation versus mere correlation.

3. Red Herring

Explanation: This fallacy distracts from the main issue by introducing an unrelated or tangential topic.

Example: A student complains that homework should be eliminated, but when pressed for reasons, he says, "Well, the school lunch is bad, too!"

Think about it. How many times have you seen an argument go off-topic? What was needed to get the discussion back to the center of the original question?

4. Bandwagon Appeal

Explanation: This fallacy suggests that something must be good or correct just because many people believe in it or do it.

Example: A student claims she must get a new phone because "Everyone in class has one!"

Does popularity make something right or logical? What are the actual merits of choice?

5. Straw Man

Deeper Explanation: This fallacy misrepresents an opposing argument to make it easier to attack.

Example: During a classroom debate about adding school uniforms, one student argues, "You just want everyone to be miserable!" instead of engaging with the actual argument.

Always rephrase arguments accurately before responding, ensuring they engage in the actual position you are defending.

6. Ad Hominem

Explanation: This fallacy attacks the person making an argument rather than addressing the argument itself.

Example: A student dismisses a classmate's argument by saying, "You don't know anything about this topic; you're just a kid."

Always focus on the reasoning behind an argument rather than the personal characteristics of those formulating it.

7. Either/Or (False Dilemma)

Explanation: This fallacy presents only two possible options when more exist.

Example: A student says, "Either we cancel all tests, or we students will be stressed forever!"

Let's recognize when more possibilities exist and encourage brainstorming multiple alternatives.

8. Appeal to Authority

Explanation: This fallacy relies on the opinion of a figure of authority, without considering actual evidence.

Example: "This book is the best because my favourite celebrity said so."

Always ask yourself, "Does this authority figure have actual expertise in the subject?". And then verify the celebrity or authority's claims with evidence.

9. Appeal to Pity

Explanation: This fallacy tries to win an argument by playing on emotions rather than using logic.

Example: A student argues that they should be class president because -they argue- "I've had a tough year, so you should vote for me."

That is why we need to separate emotional pleas from actual reasoning when making decisions.

10. Appeal to Force

Explanation: This fallacy attempts to win an argument by using threats or intimidation.

Example: A student tells the members of his study group, "If you don't support my idea, I'll make sure you don't get credit for this project."

We need to recognize when persuasion shifts from reasoning to coercion, and always use respectful debate techniques.

11. Begging the Question

Deeper Explanation: This fallacy assumes the very point that needs to be proven.

Example: "This book is a classic because it's very popular and widely read."

We must always analyze whether a claim provides actual evidence or just restates an assumption.

12. Non Sequitur

Explanation: From the Latin meaning "it does not follow", this fallacy occurs when a conclusion does not logically follow from the premises.

Example: "You don't want to volunteer at the fundraiser? Guess you don't care about the school at all!"

We should always identify when connections between ideas are missing and learn to always ask ourselves, "Does this conclusion actually follow logically?"

13. False Analogy

Explanation: This fallacy compares two things that aren't truly alike.

Example: "Our school should be run like a business because businesses are efficient."

We must evaluate whether two items being compared share meaningful similarities or if the comparison is misleading.

14. Circular Argument

Explanation: A circular argument (also called *petitio principii*) occurs when the premise of an argument assumes the truth of the conclusion, rather than providing evidence to support it. In essence, it's like trying to prove something by stating it as a fact in the first place.

Example: A student says, "God exists because the Bible says so, and the Bible is true because it is the word of God."

This Student assumes the truth of God's existence (which is the conclusion they want to arrive at) by declaring that the Bible is inspired by God (a premise that relies on the conclusion). The problem is that the argument does not offer independent evidence that supports the claim that God exists.

1.4 The Effects of Fallacious Thinking

Writing Focus

In the course of the next twelve weeks, your writing instructor will guide you through the processes of identifying problems and articulating the main issue or challenge for each specific case at issue. You will analyze each context provided by considering factors such as identifying the stakeholders, the resources affected or available, and the limitations that should be taken into account. You will also propose solutions by brainstorming potential solutions, evaluating their feasibility, as well as the consequences of their hypothetical adoption. You will explore ways to defend your decisions by using the Prompt Response Template to write a solution for a given problem in the class. Your instructor will choose which "Event" you will analyze, document and write about.

Recent Historical Events That Were Influenced by Each of the Fallacies We Have Introduced

1. Hasty Generalization

Event: Early reactions to COVID-19 (2020)

Analysis: Some people all over the world initially dismissed COVID-19 as "just another flu" based on limited early cases.

This led to delayed responses in some regions of the world.

2. Post Hoc (False Cause)

Event: The 5G Conspiracy Theory (2020)

Analysis: Some people falsely claimed that the rollout of 5G technology caused COVID-19 simply because the two events happened around the same time.

3. Red Herring

Event: Political debates on climate change

Analysis: When discussing climate policies, some politicians shift the conversation to economic concerns or personal attacks rather than addressing the facts from a scientific point of view.

4. Bandwagon Appeal

Event: The GameStop Stock Surge (2021)

Analysis: Many investors joined the GameStop stock-buying frenzy simply because others were doing it, without fully understanding the risks.

5. Straw Man

Event: Current debates over Universal Healthcare

Analysis: Some political opponents misrepresent universal healthcare as “government control over all medical decisions,” rather than engaging with the actual details of policy.

6. Ad Hominem

Event: The U.S. Presidential Elections (2020, 2024)

Analysis: During the election debates, candidates often attacked each other personally rather than focusing on policy discussions.

7. Either/Or (False Dilemma)

Event: The Brexit Debate (2016-2020)

Analysis: Some arguments framed Brexit as either “total independence” or “complete loss of sovereignty,” ignoring the several trade and diplomatic options that were available. The Brexit debate remains a complex and evolving issue, with ongoing discussions about its impact on the UK and its relationship with the European Union. Here are some key elements of analysis:

Brexit has significantly affected trade, investment, and economic growth in the UK. Many businesses have faced increased costs due to new trade barriers, while some industries, such as finance, have seen

job losses and relocations to Europe. Additionally, Brexit has exposed vulnerabilities in the UK's food system, leading to concerns about food security and trade imbalances.

8. Appeal to Authority

Event: On Media Ad Campaigns, Celebrities endorse health products

Analysis: Some celebrities have promoted unproven health treatments, leading people to trust them based on fame rather than proven scientific expertise.

9. Appeal to Pity

Event: Immigration policy debates in several countries with heavy migration movements.

Analysis: Some arguments are focused solely on emotional stories rather than discussing broader policy implications.

10. Appeal to Force

Event: The Russian invasion of Ukraine (2022)

Analysis: Russia justified its actions by claiming that Ukraine posed a threat, using military force rather than diplomatic reasoning.

11. Begging the Question

Event: Arguments against renewable energy

Analysis: Some critics claim, "Solar power is unreliable because it doesn't work all the time," assuming the very point they need to prove.

12. Non Sequitur

Event: Social media misinformation

Analysis: Some viral posts claim, “If you don’t support this movement for truth, you must hate freedom,” making an illogical leap.

13. False Analogy

Event: Comparisons between COVID-19 restrictions and dictatorship

Analysis: Some argued that mask mandates were the equivalent to authoritarian rule, despite key differences in intent and impact.

14. Circular Argument

Event: Political rhetoric surrounding election integrity debates in North America in 2025. Claim: “This election was rigged because it was unfair.” Justification: “It was unfair because it was rigged.”

Analysis: This kind of reasoning is problematic because it prevents meaningful debate or investigation. Without external evidence or logical progression, the argument becomes unfalsifiable—any challenge to it is dismissed as part of the supposed unfairness, reinforcing the original claim without scrutiny. Circular reasoning like this is especially dangerous in political contexts because it can undermine public trust in democratic institutions, Polarize discourse, making compromise or consensus more difficult, and obscure facts, making it harder for the public to discern truth from rhetoric.

As you conclude this Section, dear Writer, I hope you acknowledge that each of these examples stresses how flawed reasoning can shape public debate. This affects your life and the lives of those around you. Please feel free to research deeper into each question and find useful supporting information to back any argument that you may want to add.

1.5 Chapter Summary

Let's Reflect

In this first chapter, we have established a clear definition of critical thinking and explored its vital role in our daily lives—as students, employees, and engaged citizens in a world where overcoming cognitive biases is increasingly essential. Through meaningful conversations, we have laid the groundwork for group discussions on the fallacies of critical thinking. Additionally, we have developed materials that will enable you to engage in activities designed to deepen your understanding of these concepts.

Key Takeaways

- Critical thinking involves reflective, independent, and rational analysis of beliefs, decisions, and problems. It includes identifying logical connections, evaluating arguments, and solving problems systematically.
- Components of strong critical thinking include: Theory (*understanding the principles of logic and common reasoning error*s), Practice (applying these principles consistently through exercises, discussions, and real-life scenarios) and Attitude (*maintaining an open mind, welcoming criticism, and being willing to challenge one's assumptions*).
- Critical thinking is rooted in logic, which has evolved from ancient civilizations and was formalized by Aristotle through syllogisms—structured arguments with premises leading to a conclusion.
- Different types of syllogisms (categorical, conditional, disjunctive, universal, and particular) are used in various fields such as law, science, ethics, and computer science.
- The Socratic Method, emphasizing questioning and self-examination, laid the foundation for logical reasoning and continues to influence modern critical thinking and argumentation.
- Logical fallacies are flawed reasoning patterns that can mislead or manipulate; they often appear in arguments lacking evidence or relying on emotional or deceptive tactics.
- Common fallacies include Hasty Generalization, Red Herring, Straw Man, Ad Hominem, Appeal to Authority, and False Dilemma, among others.
- Each fallacy distorts logical reasoning and appears frequently in debates, media, and everyday arguments.
- Recognizing and avoiding fallacies is essential for sound reasoning and effective communication, especially in debates, media, and decision-making.
- Fallacies have played a role in shaping recent global events, such as misinformation during the COVID-19 pandemic and debates about climate change and immigration.
- Students are encouraged to analyze real-world cases, identify stakeholders, and propose logical solutions using structured frameworks.
- Understanding the real-world impact of fallacies helps learners become more discerning thinkers and responsible citizens in a complex, information-rich world.

Questions for Further Discussion

1. In your own words, how would you define critical thinking? How does it differ from simply being knowledgeable?
2. Think of a time when you solved a problem or made a decision rationally. What logical steps did you take, and how does this relate to critical thinking
3. How does understanding syllogisms help you construct stronger arguments in your writing? Reflect on how you might apply this structure in an upcoming assignment or essay.
4. In what ways is the Socratic Method still relevant in today's classroom or public discourse? How might it improve the way we ask questions and respond? Can you think of a time when asking questions helped you uncover a deeper truth or challenge an assumption?
5. In what ways do you see logic and algorithms influencing your daily life, especially in digital environments? Consider examples like search engines, recommendation systems, or decision-making tools.
6. Which logical fallacy do you encounter most often in everyday conversations or media? How might recognizing it change the way you respond?
7. Choose one fallacy from the chapter and explain how it could weaken an argument in an academic paper. How would you revise the argument to make it more logically sound?
8. Why do you think fallacies are so persuasive, even when they are logically flawed? Discuss how emotion, authority, or social pressure might influence reasoning.
9. Think about a recent decision you made (academic, personal, or professional). Can you identify any fallacies in your reasoning process? How would you approach the decision differently now?
10. Using a recent news story, identify a possible fallacy and rewrite the argument using sound logic and evidence.

Activity: Identify the Fallacy

Review the following 14 examples and choose the most appropriate answer that corresponds to the correct logical fallacy.

Quiz Text Description (Questions)

Multiple Choice Activity #1
"Students should be allowed to refer to textbooks for every test. After all, if professionals like doctors and lawyers can access resources to do their jobs, why can't students?"

a. Red herring
b. Begging the question
c. False analogy

Multiple Choice Activity #2
"It's a bad idea for our government to be giving so much money to help out big businesses. It's the little businesses that suffer – the money should go to them instead!"

a. Hasty Generalization
b. Red herring
c. Ad hominem

Multiple Choice Activity #3
"We either ban all social media platforms, or we let misinformation destroy our society."

a. Bandwagon Appeal
b. Straw man
c. Either/Or (False Dilemma)

Multiple Choice Activity #4
"Pro-life supporters have no respect for the rights of women. They think women are nothing more than baby-making machines."

a. Appeal to Pity
b. Begging the question
c. Straw man

Multiple Choice Activity #5
"This skincare product must be effective—my favourite actor says it works wonders!"

a. Appeal to Force
b. Appeal to Authority
c. Bandwagon Appeal

Multiple Choice Activity #6
"You should give me an A on this paper—I worked really hard on it and I've been going through a lot

lately."

a. Begging the question
b. Non Sequitur
c. Appeal to Pity

Multiple Choice Activity #7
"I met two people from that city, and they were both rude—people from that city must all be unfriendly."

a. Begging the question
b. Bandwagon Appeal
c. Hasty Generalization

Multiple Choice Activity #8
"I wore my lucky socks to the exam and got an A—those socks must have helped me pass!"

a. Post Hoc (False Cause)
b. Begging the Question
c. Either/Or (False Dilemma)

Multiple Choice Activity #9
"Everyone on social media is doing this new diet, so it must be the best way to lose weight."

a. Appeal to Force
b. Bandwagon Appeal
c. Non Sequitur

Multiple Choice Activity #10
"She's wearing expensive shoes, so she must be really good at math."

a. Ad Hominem
b. Post Hoc (False Cause)
c. Non Sequitur

Multiple Choice Activity #11
"You can't trust his opinion on climate change—he failed a science class in high school."

a. Appeal to Pity
b. Appeal to Authority
c. Ad Hominem

Multiple Choice Activity #12
"If you don't agree with my proposal for the group project, I'll make sure the professor knows you didn't contribute."

a. Appeal to Pity
b. Appeal to Authority
c. Appeal to Force

Multiple Choice Activity #13
"Reading is beneficial because it's good for you."

a. Hasty Generalization
b. Non Sequitur
c. Begging the Question

Multiple Choice Activity #14
"The law must be obeyed because it's illegal to break the law."

a. Hasty Generalization
b. Circular Argument
c. Either/Or (False Dilemma)

Quiz Text Description (Answers)

Multiple Choice Activity #1
Correct answer(s): c. False analogy

Multiple Choice Activity #2
Correct answer(s): b. Red herring

Multiple Choice Activity #3
Correct answer(s): c. Either/Or (False Dilemma)

Multiple Choice Activity #4
Correct answer(s): c. Straw man

Multiple Choice Activity #5
Correct answer(s): b. Appeal to Authority

Multiple Choice Activity #6
Correct answer(s): c. Appeal to Pity

Multiple Choice Activity #7
Correct answer(s): c. Hasty Generalization

Multiple Choice Activity #8
Correct answer(s): a. Post Hoc (False Cause)

Multiple Choice Activity #9
Correct answer(s): b. Bandwagon Appeal

Multiple Choice Activity #10
Correct answer(s): c. Non Sequitur

Multiple Choice Activity #11
Correct answer(s): c. Ad Hominem

Multiple Choice Activity #12
Correct answer(s): c. Appeal to Force

Multiple Choice Activity #13
Correct answer(s): c. Begging the Question

Multiple Choice Activity #14
Correct answer(s): b. Circular Argument

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Prompts

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CHAPTER 2: WRITING WITH CRITICAL THINKING

Chapter Overview

2.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Identify the eight key components of reasoning that form the “thinking puzzle.”
2. Explain how assumptions, point of view, and evidence shape the reasoning process.
3. Apply guided questioning techniques to evaluate the quality and clarity of one’s own reasoning.
4. Analyze how personal beliefs and perspectives influence one’s conclusions and reasoning outcomes.
5. Identify strategies to validate and justify a point of view using logic, evidence, and openness to counterarguments.
6. Describe how critical thinking strategies can support decision-making in real-life contexts.
7. Evaluate personal growth in reasoning skills by engaging in daily reflection practices.

2.1 Identifying the Pieces of the Thinking Puzzle

Critical thinking is the first step to effective reasoning and learning. To become truly reflective thinkers, students must develop the ability to assess their own thought processes, identifying the components that shape their reasoning.

This chapter explores a structured approach to self-assessment by breaking down reasoning into key elements—each representing a crucial "piece" of the thinking puzzle. By recognizing these components, students can refine their ability to think logically, evaluate arguments, and make sound judgments.

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The Pieces of the Thinking Puzzle

1. All Reasoning Has a Purpose

Every thought process is directed toward an objective. Whether solving a problem, making a decision, or exploring an idea, reasoning exists to achieve a goal. Teaching students to consciously identify their purpose helps clarify their direction and strengthens the quality of their reasoning. Educators can encourage students to ask: What am I trying to accomplish? This simple yet powerful question brings greater focus to their thought process.

2. All Reasoning is an Attempt to solve a problem or establish a Question at Issue

Reasoning does not happen by chance or come from a sudden moment of inspiration. It happens from the need to address a specific problem or question. When a person explicitly defines the issue they are tackling, then reasoning can be approached more systematically. The thinker should always consider: What problem or question am I addressing? Understanding this initial aspect in its full measure ensures the person is engaging in purposeful thinking rather than wandering aimlessly around a topic.

3. All Reasoning is Based on Assumptions

Every thought process is built upon certain assumptions—some are explicit, others are subconscious. Recognizing the underlying assumptions of a specific direction of thought allows thinkers to challenge

biases and gaps in their reasoning. Encouraging students to scrutinize their assumptions with questions like “What am I taking for granted?” fosters deeper intellectual awareness.

4. All Reasoning Begins from an Initial Point of View

Our individual perceptions are what shape our interpretations. Every person approaches reasoning from a particular viewpoint, which influences how they analyze the information they obtain. For this reason, students must be mindful of their perspectives and be open to alternative viewpoints. Asking “How does my perspective shape my reasoning?” promotes intellectual humility and broadens critical analysis.

5. All Reasoning is Based on Data, Information, and Evidence

The strength of reasoning centers on the quality and reliability of the information supporting it. Encouraging thinkers to assess their sources and differentiate between credible evidence and weak or misleading data helps them develop well-informed reasoning. As an academic thinker, you should consistently ask yourself: “What evidence supports my reasoning?”

6. All our Reasoning is Expressed and Shaped by Concepts and Ideas

Concepts frame how we interpret information. Without clear definitions, reasoning can become vague or misleading. Teaching writers to define key concepts within their thought process ensures precision and clarity. A guiding question, such as “Which concepts shape my thinking?” helps maintain theoretical consistency.

7. All Reasoning Contains Inferences from Which We Draw Conclusions

Inference is the process of interpreting data to draw conclusions. Strong reasoning requires logical and justifiable inferences rather than unsupported assumptions. Thinkers benefit from asking: “Are my conclusions logically drawn from the evidence I have?” This self-check ensures that our reasoning remains valid.

8. All Reasoning Has Implications and Consequences

Every decision we make or conclusion we express carries implications. Some are foreseeable, but others are unintended. By reflecting on the potential impact of our reasoning, we become more responsible

thinkers. Encouraging questions like “What are the consequences of this conclusion?” promotes ethical and long-term thinking.

The above elements of thought inevitably lead us to adopt strategies that can teach us self-assessment. In other words, strategies to help us cultivate reflective thinking.

2.2 Strategies for Reasoning

Guided Questioning

Using structured prompts based on the components of the thinking puzzle fosters deeper evaluation of reasoning.

1. Purpose

- What am I trying to accomplish?
- What is my reasoning goal?
- Is my purpose clear and reasonable?

Return to Thinking Puzzle 1

2. Problem or Question at Issue

- What problem or question am I addressing?
- Have I stated the issue clearly and precisely?
- Does my question lead to deeper understanding or meaningful inquiry?

Return to Thinking Puzzle 2

3. Assumptions

- What am I taking for granted?
- Are my assumptions justified, or do they need reassessment?
- How do my assumptions shape my conclusions?

Return to Thinking Puzzle 3

4. Point of View

- From what perspective am I reasoning?
- Am I open to considering other viewpoints?

- How does my perspective influence my understanding of the issue?

Return to Thinking Puzzle 4

5. Data, Information, and Evidence

- What facts, data, and evidence support my reasoning?
- Is my information reliable, relevant, and sufficient?
- Do I need to gather more information before forming a conclusion?

Return to Thinking Puzzle 5

6. Concepts and Ideas

- What concepts are shaping my reasoning?
- Are my ideas clearly defined and well-articulated?
- Could different concepts lead to a better understanding of the issue?

Return to Thinking Puzzle 6

7. Inferences and Conclusions

- How did I arrive at this conclusion?
- Is my inference logical and supported by evidence?
- Have I considered alternative interpretations?

Return to Thinking Puzzle 7

8. Implications and Consequences

- What are the potential consequences of my reasoning?
- If I act on this reasoning, what might happen?
- Could my conclusions lead to unintended effects?

Return to Thinking Puzzle 8

With the above 8 elements of thought, completely analyzed and clarified, we can then establish a point of view. This is, in short, what that entails:

Establishing Your Point of View

- What experiences, beliefs, and values shape my perspective?
- How did I arrive at my current point of view?
- Is my perspective influenced by cultural, educational, or personal factors?
- Have I considered alternative perspectives before settling on my own?
- Does my viewpoint align with evidence, logic, or emotional responses?

Once the above has been clarified, we can then validate and justify our point of view.

Validating and Justifying Your Point of View

- What reasoning supports my perspective?
- Do I have reliable evidence or logical arguments backing my stance?
- Can I clearly explain my viewpoint to others?
- Have I tested my perspective against counterarguments and opposing views?
- Does my point of view lead to reasonable conclusions and ethical implications?

This sounds like a lot of work, and well, yes, it is at first, until you master the process.

2.3 Applying Reasoning in Real Life

Let's get down to work, then, and engage in a few exercises on how to embrace the complexities of real-life reasoning.

1. Establishing Your Point of View in Real Life

- *Debates and Discussions:* When engaging in political, ethical, or social debates, understanding your viewpoint ensures you contribute meaningful arguments rather than reacting emotionally.
- *Personal and Professional Decisions:* Whether choosing a career path, making a financial decision, or resolving conflicts, recognizing what shapes your perspective allows you to make choices aligned with your values.
- *Media and Information Analysis:* In an era of misinformation, asking what factors influence your viewpoint helps you critically assess sources and avoid biased or unreliable narratives.

2. Elements to consider when validating and justifying your point of View in Real Life

- *Workplace Problem-Solving*: Presenting ideas to colleagues or superiors requires logical reasoning and evidence-based validation to gain trust and approval.
- *Academic Research and Essays*: Structuring arguments based on reliable data and sound logic ensures credibility in academic and intellectual discussions.
- *Social Advocacy and Persuasion:* Whether advocating for a social cause or negotiating policies, justifying your perspective with solid reasoning makes your argument more persuasive and impactful.

An Application Example: Negotiating a Workplace Policy

Imagine an employee proposing a flexible work schedule.

- *Establishing their Point of View:* Why do I believe flexibility benefits employees and productivity?
- *Validating their Point of View:* Do studies support this idea? Can I provide examples of successful flexible work models?
- *Justifying their Conclusion:* What potential challenges and solutions exist? How will my proposal benefit both employees and the company?

These questions serve as intellectual tools that enhance reasoning in everyday life, ensuring well-informed, fair, and strategic thinking.

Tips to Remember for Sound Reasoning

A. Cultivate Curiosity

- Approach topics with genuine interest and a willingness to explore.
- Challenge yourself to ask why, how, and what-if questions regularly.
- Read widely and expose yourself to different perspectives to fuel deeper inquiries.

B. Practice Active Listening

- Pay close attention when engaging in conversations or discussions.
- Reflect on what was said and formulate questions that probe deeper.
- Avoid rushing to conclusions; instead, clarify points by asking follow-up questions.

C. Use Open-Ended Questions

- Shift from yes/no questions to open-ended ones that invite explanation (e.g., “What are the underlying causes of this issue?” Instead of “Is this a problem?”).
- Encourage responses that require reasoning, analysis, or reflection.
- Avoid leading questions that subtly suggest an answer.

D. Identify Assumptions

- Before asking, consider what assumptions might shape your understanding.
- Challenge yourself and others by questioning what is being taken for granted.
- Ask questions like, “What assumptions are influencing this perspective?”

E. Apply the Socratic Method

- Ask systematic, thought-provoking questions to examine ideas critically.
- Push for deeper thinking by questioning definitions, evidence, and implications.
    - Example: What evidence supports this claim? → Is this evidence credible? → What alternative viewpoints exist?

F. Reflect on the Purpose of Your Question

- Are you seeking information, clarification, or a challenge to your thinking?\
- Ensure your questions align with the goal of your inquiry.
- Ask yourself, What do I hope to learn or achieve with this question?

G. Embrace Intellectual Humility

- Be open to answers that challenge your initial thoughts.
- Recognize that good questioning may lead to complex or uncertain answers.
- Accept that not every question has a simple or immediate solution.

H. Keep Practicing

- Engage in discussions with people who challenge your thinking.
- Analyze your own thought process and ask yourself questions about your reasoning.
- Write down questions about topics of interest and explore their answers.

2.4 Practical Exercises in Reasoning

Additional Practical Exercises

A. Question-Storming

- Choose a topic, problem, or idea.
- Write down as many questions as possible about it within a set time (e.g., 5 minutes).
- Avoid judging or answering the questions—just focus on generating them.
- Afterward, categorize questions into different types (clarifying, probing, challenging).

B. Socratic Dialogue Practice

- Pick a statement or assumption you believe to be true.
- Systematically question it using Socratic questioning (e.g., What evidence supports this? → Are there alternative interpretations? → What are the implications?).
- Discuss with a partner or reflect on your own answers.

C. Reverse Questioning

- Take a common answer or belief and turn it into a question.
- Example: Instead of stating, “Exercise is good for your health”, ask, “why is exercise beneficial?” “What makes it effective?”
- This shift focuses on exploring the underlying reasoning.

D. Question Ladder

- Start with a simple question, then make it progressively deeper.
- Example:
    - What is climate change? (Basic)
    - What causes climate change? (Intermediate)
    - How do economic policies impact climate change? (Advanced)
    - What ethical dilemmas arise in addressing climate change? (Complex)

E. Question Swap

- In a group or one-on-one discussion, exchange a question with someone else.

- Try answering their question, then refine it to make it more insightful.
- Example: How do smartphones affect productivity? → In what ways do smartphones enhance or hinder deep work?

F. Critical Reading Questions

- While reading an article or book, pause and ask:
- What is the author assuming?
- What are the key arguments?
- What evidence supports these claims?
- What perspectives might challenge this viewpoint?

G. The “Why” Chain

- Ask Why? about a topic, then keep going deeper.
- Example:
    - Why do people fear public speaking?
    - Why does social pressure influence confidence?
    - Why does the brain react to public speaking with anxiety?

This exercise promotes curiosity and layered thinking.

H. Daily Reflection Questions

At the end of each day, reflect with questions like:

- What did I learn today?
- What assumptions did I challenge?
- What could I have asked better in conversations?

2.5 Elements of Thought Activity

Applying the Elements: Film Activity

Analyze and evaluate an event or a film using the 8 elements of thought to discern fundamental concepts in the study of politics.

Text Description

Elements of Thought Activity: Applying the Elements

Learning Outcomes

Critical Thinking (Elements) Skills Applied:

- Identify key concepts with accuracy
- Define the issue(s) at hand with as much clarity as possible
- Demonstrate a clear and obvious understanding of film's purpose/message (relevance and significance)
- Describe the depth and breadth of the film subject or topic to avoid superficial interpretations in fairness, while considering different points of view(s)

Instructions

Analyze and evaluate an event or a film to discern fundamental concepts in the study of politics.

NOTE: *During the event or film, please record your thoughts, impressions and interpretations regarding the elements below. Your responses will be reviewed for depth and breadth to determine how well you can apply the elements to your thinking.*

Element of Thought 1

Purpose

The main purpose of this film is....
*State the purpose as **accurately** and **precisely** as possible*

Element of Thought 2

Question, Problem or Issue

The [key focus] that the film is addressing is....
*What does the film **clarify** or convey to the audience?.*

Element of Thought 3

Information

The most important information in this film is....
*Are the facts, experiences, data or examples used to support claims **clear, accurate and relevant? Give example.***

Element of Thought 4

Interpretations/Inferences:

The film interpretation is consistent with....
*What **significant** conclusions can be drawn from the inferences made? **Give example**.*

Element of Thought 5

Concepts:

The key concepts highlighted in this film....
*Record the most important idea(s) you have to understand in order to understand the film's **logic** or reasoning.*

Element of Thought 6

Assumptions:

The main assumption(s) underlying this film is (are)....
*Does the film take some issues for granted **(depth)**? **Give example.***

Element of Thought 7

Implications/Consequences:

- If we take this film seriously, the implications are....
- If we fail to take this film seriously, the implications are....

*What are the broad consequences **(breadth)** that follow from either position?*

Element of Thought 8

Point(s) of View:

The main point(s) of view presented in the film is (are)....
*From what point of view **am I** looking at this film?*
*In **fairness**, is there another point of view I should consider?*

2.6 Chapter Summary

Let's Reflect

Helping you assess your own thinking is essential for developing your independent and rational thinking. By breaking reasoning into structured components—the "pieces" of the thinking puzzle—you will gain a clearer understanding of how you form ideas, make judgments, and solve problems. By prioritizing self-assessment in your instruction, we are empowering you to become more thoughtful, disciplined, and effective in your intellectual pursuits.

Key Takeaways

- Reasoning is composed of eight interrelated components: purpose, question at issue, assumptions, point of view, evidence, concepts, inferences, and implications.
- Each component shapes the quality of reasoning and must be consciously examined to improve critical thought.
- Learners benefit from recognizing how their assumptions, viewpoints, and the evidence they use affect their conclusions.
- Guided questioning helps learners self-assess each component of their reasoning, such as asking, “What am I taking for granted?” or “What supports my conclusion?”
- Establishing and justifying one’s point of view requires identifying influences (e.g., beliefs, culture), validating it with evidence, and being open to alternative perspectives.
- Key tips for sound reasoning include cultivating curiosity, practicing active listening, using open-ended questions, identifying assumptions, applying the Socratic method, reflecting on the purpose of questions, embracing intellectual humility, and consistent practice.
- Reasoning skills enhance effectiveness in debates, decision-making, academic writing, and media literacy.
- Critical thinkers must consider how their viewpoints were shaped and whether they are supported by reliable, logical reasoning.
- Real-world examples (e.g., workplace negotiations) demonstrate the practical application of establishing and validating a point of view.
- Exercises such as question-storming, Socratic dialogue, and the “Why” chain help learners practice critical questioning.
- Strategies such as reverse questioning and the question ladder deepen inquiry and promote critical thinking.
- Daily reflection and critical reading questions foster ongoing improvement in reasoning skills and self-assessment.

Questions for Further Discussion

1. What is the purpose behind your most recent written assignment? How does identifying this purpose help clarify your argument?
2. Think of a recent decision you made. What assumptions did you bring into your reasoning process, and were they justified?
3. How might your point of view have limited your ability to see alternative solutions to a problem?
4. Why is it important to distinguish between data and assumptions when evaluating evidence in academic work?
5. How do you ensure that the concepts you use in your writing are clearly defined and understood by your audience?
6. Select one of your current assignments. What is the "question at issue" you are trying to explore?
7. How can you use guided questioning (e.g., "What am I taking for granted?") to improve the depth of your arguments?
8. How do you validate your point of view in writing? What types of evidence or logic do you typically rely on?
9. Describe a time when someone challenged your perspective. How did you respond, and what did you learn?
10. Think of a recent news article or social media post you shared or commented on. What influenced your point of view, and did you critically evaluate it?
11. Describe a real-life scenario where using evidence to support your reasoning helped you persuade someone or defend your view.
12. What are the benefits of embracing intellectual humility when forming opinions on controversial topics?
13. How can the Socratic Method be used during peer review to improve the quality of someone's essay or argument?
14. Reflect on a recent reading assignment. What assumptions did the author make, and how did those influence the argument?

Activity: Pieces of the Thinking Puzzle

Review the following questions about “Pieces of the Thinking Puzzle” outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

What guiding question helps clarify the direction of your thought process?

a. What is my personal bias?
b. What evidence have I used?
c. What am I trying to accomplish?
d. What do others think?

2. MultiChoice Activity

Reasoning begins with identifying a specific problem or question. What question should a critical thinker ask to ensure purposeful reasoning?

a. What is my emotional reaction?
b. How do others feel about this?
c. What’s the easiest solution?
d. What problem or question am I addressing?

3. MultiChoice Activity

Which of the following best describes an assumption in the reasoning process?

a. A belief taken for granted, often without proof
b. An example used for illustration
c. A proven fact supporting the argument
d. A widely accepted societal norm

4. MultiChoice Activity

How does a person’s point of view affect reasoning?

a. It has no real impact on critical thinking
b. It shapes how they interpret and analyze information
c. It ensures objectivity in every case
d. It helps determine the truth

5. MultiChoice Activity

What is the role of data, information, and evidence in reasoning?

a. They support reasoning with verifiable input
b. They distract from personal opinion
c. They complicate the thinking process
d. They reduce the need for assumptions

6. MultiChoice Activity

Why is it important to define the concepts and ideas used in reasoning?

a. To ensure clarity and consistency in interpretation
b. To avoid using data and evidence
c. To reduce the amount of evidence needed
d. To make writing sound more complex

7. MultiChoice Activity

Which of the following best explains the role of inference in reasoning?

a. Drawing conclusions based on evidence and data
b. Making assumptions about the future
c. Accepting conclusions from authority figures
d. Guessing based on intuition

8. MultiChoice Activity

Why should critical thinkers reflect on the consequences of their conclusions?

a. To predict how others will react
b. To understand potential implications and act responsibly
c. To reduce the complexity of their argument
d. To justify their assumptions

9. MultiChoice Activity

Which strategy helps students identify hidden biases in their thinking?

a. Questioning what they are taking for granted
b. Seeking agreement from peers
c. Repeating familiar arguments
d. Ignoring alternative viewpoints

10. MultiChoice Activity

When evaluating your reasoning, why is it important to consider alternative viewpoints?

a. To make your reasoning more complex
b. To broaden your understanding and reduce personal bias
c. To avoid taking a clear stance
d. To include emotional appeals

Quiz Text Description (Answers)

1. c. What am I trying to accomplish?
2. d. What problem or question am I addressing?
3. a. A belief taken for granted, often without proof
4. b. It shapes how they interpret and analyze information
5. a. They support reasoning with verifiable input
6. a. To ensure clarity and consistency in interpretation
7. a. Drawing conclusions based on evidence and data
8. b. To understand potential implications and act responsibly
9. a. Questioning what they are taking for granted
10. b. To broaden your understanding and reduce personal bias

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CHAPTER 3: STANDARDS OF CRITICAL THINKING

Chapter Overview

3.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Define the key standards of critical thinking and explain their role in evaluating reasoning.
2. Evaluate written arguments to identify logical gaps, unsupported claims, or flaws in reasoning.
3. Interpret texts with intention by clarifying ambiguous statements and identifying the author's underlying purpose in real-world contexts.
4. Apply a writing prompt response template to organize your ideas and construct structured, well-supported arguments.
5. Summarize texts accurately and concisely, capturing the main ideas and supporting points.
6. Synthesize information from multiple texts to develop an original and coherent argument or perspective.

3.1 What are the Standards of Critical Thinking?

The **Standards of Critical Thinking** are the tools that help a reader/writer to assess *clarity, accuracy, precision, relevance, depth, breadth, logic and fairness* in a text. Let's begin with some definitions:

Clarity

- **What it means:** Clarity is about making your meaning easy to understand. If your statement is vague or ambiguous, it's hard for others to engage with your ideas.
- **Why it matters:** Without clarity, we can't assess the truth or relevance of a claim. It's the first step in meaningful dialogue.
- **Example:** Instead of saying "He's doing well," clarify with "He's recovering steadily from surgery and can now walk unaided."

Accuracy

- **What it means:** Accuracy ensures that information is true and free from errors or distortions.
- **Why it matters:** Inaccurate information leads to faulty conclusions. Even a clear statement can be misleading if it's not accurate.
- **Example:** Saying "The Earth is flat" may be clear, but it's not accurate. Accuracy demands evidence and verification.

Precision

- **What it means:** Precision adds exactness and specificity to a statement.
- **Why it matters:** Vague terms can lead to misinterpretation. Precision helps narrow down meaning and avoids generalizations.
- **Example:** Instead of "Many people attended," say "Approximately 150 people attended the event."

Relevance

- **What it means:** Relevance ensures that the information or argument directly relates to the issue at

hand.

- **Why it matters:** Irrelevant details distract from the core issue and weaken the argument.
- **Example:** In a discussion about climate change, bringing up ancient Roman architecture is irrelevant—unless you're linking it to historical climate patterns.

Depth

- **What it means:** Depth involves addressing the complexities of an issue and not oversimplifying.
- **Why it matters:** Shallow thinking ignores important nuances and can lead to superficial or misleading conclusions.
- **Example:** Saying "Just eat less to lose weight" lacks depth. A deeper analysis would consider metabolism, mental health, and socioeconomic factors.

Breadth

- **What it means:** Breadth considers multiple perspectives and alternative viewpoints.
- **Why it matters:** Narrow thinking can lead to bias. Breadth helps us see the bigger picture and fosters open-mindedness.
- *Example:* A debate on immigration should include economic, humanitarian, and legal perspectives, not just one.

Logic

- **What it means:** Logic ensures that reasoning follows a coherent and consistent path.
- **Why it matters:** Illogical arguments may contain contradictions or unsupported leaps in reasoning.
- **Example:** "All cats are animals. My dog is an animal. Therefore, my dog is a cat." This is logically flawed.

Fairness

- **What it means:** Fairness involves being impartial and free from bias or favouritism.
- **Why it matters:** Biased reasoning undermines credibility and can alter the truth.
- **Example:** If a teacher always sides with one student regardless of the facts, his/her judgment lacks fairness.

Together, these standards provide a powerful toolkit for evaluating and improving our thinking.

3.2 Real-Life Examples of the Standards of Critical Thinking

Clarity

Example: A doctor explaining a diagnosis to a patient avoids medical jargon and says, “You have a mild infection in your lungs, which we will treat with antibiotics,” instead of “You have acute bronchitis.”

Why it matters: Clear communication ensures understanding and reduces confusion or anxiety.

Return to Clarity definition

Accuracy

Example: A journalist double-checks facts before publishing an article, confirming the date of an event and quoting sources correctly.

Why it matters: Inaccurate reporting can mislead the public and damage credibility.

Return to Accuracy definition

Precision

Example: A weather forecast says, “There’s a 70% chance of rain between 2 PM and 5 PM,” rather than “It might rain later.”

Why it matters: Precision helps people make informed decisions—like whether to carry an umbrella or reschedule outdoor plans.

Return to Precision definition

Relevance

Example: In a job interview, a candidate focuses on his/her experience managing teams when applying for a leadership role, rather than discussing unrelated hobbies.

Why it matters: Staying relevant keeps communication focused and purposeful.

Return to Relevance definition

Depth

Example: A city planner evaluating traffic congestion doesn't just blame rush hour—he/she also considers infrastructure, public transit options, and urban design.

Why it matters: Deep thinking uncovers root causes and leads to more effective solutions.

Return to Depth definition

Breadth

Example: A school board discussing curriculum changes invites input from teachers, parents, students, and community leaders to understand diverse perspectives.

Why it matters: Breadth ensures decisions are inclusive and well-rounded.

Return to Breadth definition

Logic

Example: A student argues, "I studied hard, and the test covered what I studied, so I expected to do well." The reasoning follows a logical sequence.

Why it matters: Logical thinking helps build strong, persuasive arguments and avoid contradictions.

Return to Logic definition

Fairness

Example: A teacher grades essays using a rubric applied equally to all students, regardless of personal feelings or past performance.

Why it matters: Fairness builds trust and ensures justice in decision-making.

Return to Fairness definition

3.3 Recommendations for Applying the Standard

Applying the Standards to Your Writing.

Academic writing is its own kind of art form. It's not just about stringing ideas together, but about presenting them with clarity, structure, and credibility. These are the elements we must refine to the best of our ability.

Clarity and Precision

Make every sentence count. Avoid vague phrases like "some people say" or "it could be." Instead, specify who, what, where, and how. If your reader has to guess what you mean, rewrite it.

Structure and Organization

Start with a strong **thesis statement**—your central argument. Then build your paragraphs like mini-essays: each with a clear topic sentence, supporting evidence, and a tie-back to the main idea.

Tip: Use transitions to create a smooth, logical flow from one point to the next.

Evidence-Based Reasoning

Academic writing is all about *supporting your claims*. Use data, examples, expert opinions, or credible texts—and always cite your sources properly. No argument stands strong without a foundation.

Objectivity and Fairness

Your tone should be analytical, not emotional. That doesn't mean your writing has to be lifeless; it just needs to be balanced. Present counterarguments fairly and explain why you agree or disagree with them using evidence.

Critical Thinking

Don't just describe or summarize—*analyze*. Ask yourself: What's the author really arguing? Is there a hidden assumption? Are there flaws in reasoning? Your interpretation and insight are what transform a good paper into a powerful one.

Formality and Style

Academic tone is professional and avoids contractions (say “do not” instead of “don’t”). Aim for clear and concise language. Think *refined*, but not *pompous*.

Revision and Proofreading

Remember, your first draft is never your best. Reread your work to reinforce arguments, fix typos, check citations, and polish the flow of your text.

3.4 The Prompt Response Template

In this section, we will take a detailed tour of the Prompt Response Template that you will be using during the entire semester. A Prompt Response Template is a structured framework that is used to guide your response to a specific academic or analytical prompt. It is a written checklist or frame that helps you stay focused, organized, and critically engaged with a text or question. It is especially useful when you are asked to analyze or respond to a reading, an article, a film, a speech or an argument.

You will initially focus on understanding the P.R.T. (Prompt Response Template) to help you focus on the following tasks:

- Identifying the source,
- Identifying the author,
- Identifying the Thesis Statement presented by the author of the text, and
- Identifying the statements used by the author in support of his thesis.

These elements will help you as you begin to plan or shape an Academic response to a prompt that has been brought before you for consideration.

Let's engage in an initial breakdown of what your P.R.T. includes:

Identification of the Source

- *What are you responding to?*
- Include the title of the text, the type of source (e.g., article, essay, speech), and where it was published.

Identification of the Author

- *Who wrote it?*
- Mention the author's name and, if relevant, their background or perspective that might influence the text.

Thesis Statement of the Text

- *What is the author's main argument or purpose?*
- Summarize the central claim or message the author is trying to convey.

Supporting Statements

- *How does the author support their thesis?*
- Identify and summarize the key points, evidence, and rhetorical strategies used by the author to build his argument. (The summary of the Author's Prompt)

The Prompt Response Template

Download a copy of the prompt response writing template in MS Word (45.9 KB) or PDF (75.5 KB).

Paragraph 1: Introduction

In the editorial/article titled "_____ that appears in _____ (*publication/source*) on _____ (*day/month/year*), the author _____ argues that _____ (*summarize author's central thesis*). To support this thesis, the author presents the following key points: The author is ☐ right ☐ partially right ☐ wrong, because _____ (*state your overall judgment or thesis about the argument*).

Paragraph 2: First Supporting Argument and Analysis

The author's first main argument is that _____ (*summarize argument*). This argument is weakened by the fallacy of ☐ hasty generalization ☐ appeal to emotion ☐ anecdotal evidence ☐ other: _____, because _____ (*explain why the argument lacks fairness, accuracy, clarity, etc.*). Additionally, the author fails to consider _____ (*mention a missing perspective or critical point*).

Paragraph 3: Second Supporting Argument and Analysis

The second argument the author presents is that _____. This reasoning reflects the fallacy of ☐ false cause ☐ slippery slope ☐ stereotyping ☐ other: _____, which undermines its logical strength. The argument lacks ☐ relevance ☐ depth ☐ breadth, because _____ (*critique the evidence, assumptions, or logic*).

Paragraph 4: Third Supporting Argument and Analysis

Finally, the author claims that _____. This argument contains the fallacy of ☐ ad hominem ☐ false dilemma ☐ red herring ☐ other: _____. Rather than focusing on _____. This undermines the ☐ fairness ☐ logic ☐ objectivity of the position, and ignores the fact that _____ (*provide a counterpoint or overlooked dimension*).

Paragraph 5: Conclusion

To conclude, the author's arguments suffer from several critical thinking fallacies, including _____, and _____ (*list fallacies discussed*). These weaken the overall effectiveness of the text. Although the topic deserves thoughtful discussion, the author's position should be ☐ rejected ☐ accepted ☐ revised, because _____ (*summarize your final academic reason*).

3.5 Applying the Template

Now let's apply this template to specific examples.

Example 1

Consider this example of a possible short prompt:

The following short comment appears in the November 2024 issue of "Defending Our Future: Why Environmental Regulation Is Dangerous" and is written by Pierangelo Pacini[1].

Anyone who supports environmental regulations clearly hates economic growth. These so-called 'green activists' want to shut down our industries, kill jobs, and send us back to the Stone Age. I say to you: You're either with us and support progress, or you're with them and want to destroy our way of life. Besides, many of these activists fly on private jets—so how serious can they really be about climate change? If we don't act now to stop them, our country will be overrun by radical policies that will bankrupt families and leave us defenceless.

Notice that this prompt includes the following errors:

- Strawman Fallacy: Misrepresents environmentalists as anti-progress.
- Either/Or (False Dilemma): Presents only two extreme options—supporting industry or destroying the economy.
- Ad Hominem: Attacks the character of activists rather than their arguments.
- Appeal to Force: Suggests dire consequences without evidence.

1. The following article has been created by the author for demonstrative purposes; it's not a real publication.

Prompt Response 1

Here is a 5-paragraph response to the above example:

Paragraph 1: Introduction

In the comment titled “Defending Our Future: Why Environmental Regulation Is Dangerous,” Pierangelo Pacini presents a one-sided and emotionally charged argument against environmental activism. The author argues that supporters of environmental regulations are against economic progress, seek to eliminate jobs, and even threaten national security. Key supporting points include: (1) the belief that environmentalists want to destroy industry and jobs, (2) claims of hypocrisy by activists who use private jets, and (3) fear-based warnings that failing to oppose these activists will lead to economic and social collapse. The author is wrong because his arguments rely heavily on logical fallacies, biased assumptions, and lack balanced reasoning.

Paragraph 2: First Supporting Argument and Analysis

The author’s first main argument is that people who support environmental regulation are anti-progress and want to shut down industries. This commits a strawman fallacy, misrepresenting the position of environmentalists by reducing their goals to a risky misrepresentation. Most environmental advocates promote sustainable development—not economic collapse. The argument also lacks breadth, as it ignores the growing green economy, innovations in clean energy, and studies that show environmental regulations can boost long-term job creation.

Paragraph 3: Second Supporting Argument and Analysis

The author then argues that climate advocates are hypocrites because some of them use private jets. This commits an ad hominem fallacy, attacking individuals instead of engaging with the substance of their ideas. It also uses the tu quoque fallacy (“you too”) to dismiss legitimate concerns by pointing to perceived hypocrisy. This distracts from the relevance of climate science or the merit of proposed policies. Even if some individuals act inconsistently, the fundamental arguments for environmental action remain intact.

Paragraph 4: Third Supporting Argument and Analysis

Finally, the author warns that if we don’t “act now,” radical policies will bankrupt families and “leave us defenceless.” This is an appeal to fear, presenting a worst-case scenario without evidence. It also commits the false dilemma fallacy, suggesting we must either support unchecked industrial growth or face ruin—ignoring balanced alternatives like green innovation, transitional policies, or regulated growth. This argument lacks logic, depth, and fairness, and is designed more to provoke than to inform.

Paragraph 5: Conclusion

To conclude, the author's central arguments are undermined by several critical thinking fallacies, including the strawman, ad hominem, tu quoque, false dilemma, and appeal to fear. These fallacies weaken the credibility and academic value of the author's writing. While public debate about environmental policy is vital, this commentary fails to engage in that debate constructively or ethically. For these reasons, the author's argument should be rejected as an example of poor reasoning and manipulative rhetoric.

Example 2

Now let's explore a longer Prompt. Let's work with the following example (*Read carefully and take notes as you read*):

The following editorial, "Why We Shouldn't Feed the Homeless," by C. Montgomery Hall, appears in the Community Voice column of the 2025 edition of *Vancouver Monthly* magazine[2].

Organizations like Mission Services, the Salvation Army, Women's Community House, and even the United Way act as enablers of homeless people. The fact that these institutions run shelters and social programs actually increases the problem.

Some of us may even have known of one case where a person faked a psychiatric problem just to get some time away from work and live in an institution for a month. He probably got free room and board at the expense of government funds.

Street life is not so bad in any case. Perhaps folks have also heard of people making hundreds of thousands of dollars pan-handling from sympathetic strangers and then taking a tax-free trip to Florida in the winter!

People who send charitable donations to finance food banks, student share shops, and local church hot-breakfast programs are like smelt that end up en masse in fishermen's nets! These kind souls are being trapped by their own good intentions. Most people on welfare are cheating the system, and those who finance these deadbeats are simply encouraging abuse of tax-payers dollars that could be used to fix roads or preserve the environment for future generations of cottage owners.

If a person were to lose all financial support systems, have psychiatric problems or suffer from abuse as a teen, he or she would not necessarily hit the streets—the "victim" of such abuse could take up residence in one of the convenient shelters run by tax-payers dollars and the donations of fools. Why should people worry when these rescue operations can look after them?

We should all go with the majority on this issue, since charitable donations to organizations that feed the homeless are noticeably down in recent years: people are getting wise when it comes to saving their own money and not wasting it on those who do not deserve our sympathy or our care.

2. ibid.

Prompt Response 2

Here is a response using the template:

Paragraph 1: Introduction

In the editorial "Why We Shouldn't Feed the Homeless," published in the Community Voice column of the 2009 edition of Vancouver Monthly, author C. Montgomery Hall argues that charitable organizations and social programs worsen homelessness by enabling dependency and the abuse of public resources. Hall claims that shelters and food programs encourage people to remain homeless, citing anecdotal examples of individuals faking mental illness or profiting from panhandling and then going for a vacation in Florida. He also suggests that most welfare recipients are dishonest and that charitable donors are naïve. Hall then concludes that declining donations reflect growing public awareness of the fact that the homeless are undeserving of support. While Hall raises concerns about a potential misuse of social services, his argument is largely flawed, exaggerated, and lacking in fairness and depth, and it relies heavily on logical fallacies that weaken its credibility.

Paragraph 2: Analysis of the First Argument

Hall's first major argument is that shelters and social programs increase homelessness by making it easier for people to avoid responsibility. He cites organizations like Mission Services and the Salvation Army as "enablers" and implies that access to support encourages laziness and fraud. This reasoning commits the hasty generalization fallacy—drawing a broad conclusion from very limited evidence or hearsay. Additionally, Hall's use of emotionally charged language like "enablers" and "deadbeats" reflects an appeal to emotion, which distracts from rational analysis and an Ad Hominem attack aimed at the homeless. His failure to provide data or consider the structural causes of homelessness also reveals a lack of **depth** and **accuracy** in his argument.

Paragraph 3: Analysis of Second Argument

The second argument Hall presents is that some homeless individuals exploit the system for personal gain, such as faking psychiatric issues or earning large sums through panhandling. He even suggests that some take "tax-free trips to Florida." This claim relies on the **anecdotal fallacy**, using isolated or exaggerated stories as if they represent the norm. It also borders on the **false cause fallacy**, implying that the existence of shelters causes homelessness without evidence of causation. Furthermore, Hall's sarcastic tone and sweeping generalizations reflect **bias** and a lack of **fairness**, undermining the credibility of his claims.

Paragraph 4: Analysis of Third Argument

Hall's final argument is that charitable donors are foolish and that welfare recipients are "deadbeats"

who cheat taxpayers. He suggests that public funds should be redirected to infrastructure or environmental preservation. This reasoning includes an ad hominem fallacy, attacking the character of welfare recipients and donors rather than addressing the effectiveness of social programs. It also commits the **false dilemma fallacy**, presenting a choice between helping the homeless or fixing roads, as if both cannot be done. His argument lacks **relevance**, **logic**, and **breadth**, as it ignores the broader social and economic benefits of supporting vulnerable populations.

Paragraph 5: Conclusion

In summary, Hall's editorial relies heavily on **logical fallacies** such as hasty generalization, anecdotal evidence, ad hominem attacks, and false dilemmas. These errors in reasoning, combined with a dismissive tone and lack of evidence, weaken the overall argument. While accountability in social programs is a valid concern, Hall's approach lacks the **clarity**, **fairness**, and **critical depth** required for a persuasive and ethical argument. For these reasons, his position should be rejected on academic and logical grounds.

3.6 Chapter Summary

Let's Reflect

This chapter introduced and explored eight essential standards of critical thinking. These standards serve as a toolkit for you to analyze texts critically and to improve the structure and credibility of your arguments. The most impactful aspect of your understanding of critical thinking when you approach your own writing is the emphasis on fairness and logic, which are critical for maintaining ethical, balanced, and persuasive arguments. Mastering these standards equips you with the ability to not only critique others' work but also refine your own, leading to more compelling writing and well-informed reasoning in both academic and real-world contexts.

Key Takeaways

- The eight critical thinking standards are: Clarity, Accuracy, Precision, Relevance, Depth, Breadth, Logic, and Fairness.
- These standards help assess the quality of reasoning in both reading and writing.
- Each standard includes a definition, its importance in reasoning, and an example illustrating its application.
- Everyday examples demonstrate how critical thinking standards apply in diverse contexts (e.g., journalism, education, healthcare).
- Clear, accurate, and precise communication improves decision-making and credibility.
- Relevance, breadth, and fairness are key to ethical and inclusive discourse.
- Academic writing should emphasize clarity, structure, evidence, and fairness.
- Writers are encouraged to revise, use objective language, and anticipate counterarguments.
- Critical analysis involves identifying flaws and assumptions rather than just summarizing content.
- A structured five-paragraph template guides academic responses to arguments or texts.
- Students should always identify the source, author, thesis, and supporting statements when responding to a prompt.
- The template encourages analysis of fallacies, logic, and counterarguments in each supporting claim.

Questions for Further Discussion

1. Which of the eight critical thinking standards do you think is the most difficult to apply in your own writing? Why?
2. Can you think of a time when a lack of clarity or accuracy in communication led to a misunderstanding? What might have improved the situation?
3. Why is fairness considered essential when evaluating arguments or opposing views in academic writing?
4. Choose one of the eight standards and describe how it could be applied in a professional setting (e.g., journalism, business, education).
5. How do the examples in Section 3.2 help you better understand the difference between precision and accuracy?
6. Reflect on a recent article or video you encountered. Which of the standards did it meet well, and where did it fall short?
7. When revising your writing, how do you ensure your reasoning is both logical and well-organized?
8. Why is it important to consider objectivity and fairness in your tone and presentation when writing academically?
9. In what ways do critical thinking and evidence-based reasoning enhance the quality of your arguments?
10. What do you find most helpful about using a structured template when crafting academic responses?
11. Which part of the Prompt Response Template do you struggle with most (e.g., identifying fallacies, summarizing the author's thesis, etc.)? Why?
12. How can applying this template improve the way you analyze texts and organize your responses to written prompts?
13. After reviewing the sample response to the editorial "Why We Shouldn't Feed the Homeless," what logical fallacies did you recognize most easily?
14. How can practicing with flawed arguments help you strengthen your own reasoning skills?
15. What strategies can you use to remain fair and objective when responding to emotionally charged or biased texts?

Activity: The Standards of Critical Thinking

Review the following questions about the standards of critical thinking and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity
What does the standard of Clarity focus on?

a. Adding as many ideas as possible
b. Making meaning easy to understand
c. Using difficult vocabulary to appear smart
d. Making statements easy to ignore

2. MultiChoice Activity
What is the main risk of using inaccurate information?

a. It enhances creativity
b. It supports emotional arguments
c. It leads to faulty conclusions
d. It improves storytelling

3. MultiChoice Activity
Which of the following best represents precision?

a. “It was a big crowd.”
b. “Approximately 150 people attended the event.”
c. “Lots of people came.”
d. “There were many attendees.”

4. MultiChoice Activity
Why is relevance important in critical thinking?

a. It supports generalizations
b. It provides emotional appeal
c. It ensures arguments are connected to the issue at hand
d. It impresses the audience

5. MultiChoice Activity
What does it mean to approach an issue with depth?

a. Focusing on one perspective
b. Skipping over complex details
c. Only using simple language
d. Considering all contributing factors and complexity

6. MultiChoice Activity
What does the standard of Breadth ask us to do?

a. Focus on only one solution
b. Dismiss alternative approaches
c. Consider multiple perspectives
d. Ignore opposing views

7. MultiChoice Activity
Which reasoning is logically flawed?

a. “All dogs are animals. My dog is an animal. Therefore, my dog is a dog.”
b. “I studied and passed the test.”
c. “All cats are animals. My dog is an animal. Therefore, my dog is a cat.”
d. “Fish swim. Dolphins swim. Therefore, dolphins might be fish.”

8. MultiChoice Activity
What is an example of fairness in critical thinking?

a. Grading all students using the same rubric
b. Only listening to one side of a story
c. Choosing sides based on emotion
d. Giving higher grades to favorite students

9. MultiChoice Activity
Which of the following statements lacks clarity?

a. “He’s now walking with a cane.”
b. “He is improving every day.”
c. “He’s doing well.”
d. “He will recover from surgery within 3 weeks.”

10. MultiChoice Activity
Why is logic important to argument building?

a. It encourages emotional expression
b. It shortens your reasoning
c. It makes writing look smarter
d. It ensures ideas connect coherently

Quiz Text Description (Answers)

1. b. Making meaning easy to understand
2. c. It leads to faulty conclusions
3. b. “Approximately 150 people attended the event.”
4. c. It ensures arguments are connected to the issue at hand
5. d. Considering all contributing factors and complexity
6. c. Consider multiple perspectives
7. c. “All cats are animals. My dog is an animal. Therefore, my dog is a cat.”

8. a. Grading all students using the same rubric
9. c. “He’s doing well.”
10. d. It ensures ideas connect coherently

Appendix: Additional Resources

- Logical fallacy interactive activities from yourlogicalfallacyis.com

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OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author’s own work into ChatGPT. The results were reviewed, edited, and modified by the author:

- Key Takeaways Prompt: *“Create a chapter summary using a bulleted list for the attached file entitled “Chapter 3 -The Standards of Critical Thinking.”*
- Questions for Further Discussion Prompt: *“Create a series of questions for reflection and classroom discussion for the attached file entitled “Chapter 3 -The Standards of Critical Thinking.”*

CHAPTER 4: RECOGNIZING AND CHALLENGING ASSUMPTIONS

Chapter Overview

4.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Identify the types of assumptions there are and why they matter.
2. Discuss the necessity of assumptions to support and validate thoughts, arguments, perceptions and ideas derived from the examination of elements of the thinking process.
3. Identify unstated ideas that shape how a writer frames an issue or selects evidence in support of a claim.
4. Examine how faulty assumptions distort the thinking process and weaken the credibility of arguments that are crafted because of the faulty perception of a matter at hand.
5. Identify faulty assumptions and revise the text to avoid errors.

4.1 Identifying and Challenging Assumptions in Academic Writing

Seeing the Unseen

Academic writing is often viewed as a disciplined exercise in clarity, logic, and evidence, but beneath every well-crafted argument lies a web of assumptions. These assumptions guide interpretation, shape inquiry, and influence conclusions, whether the writer is aware of them or not. Understanding the distinction between explicit and implicit assumptions is crucial for developing rigorous, self-aware, and persuasive writing. This chapter examines the role of assumptions within texts, their significance, and how writers can cultivate the critical skills necessary to question, revise, and refine them.

Assumptions are beliefs or premises that we accept—sometimes unconsciously—as true. They support every argument and claim, often operating silently beneath the surface of a specific piece of writing.

Explicit Assumptions

Explicit assumptions are openly stated in the text. These might appear as:

- Hypotheses in scientific papers
- Premises in formal arguments
- Thesis statements or topic sentences in essays

These explicit assumptions are easily identifiable and can be evaluated based on their clarity and the evidence that can support them.

Implicit Assumptions

Implicit assumptions, on the other hand, lurk in the shadows. They are unstated ideas that shape how a writer frames an issue or selects evidence.

Implicit assumptions may be:

- Cultural or disciplinary norms
- Unquestioned values or ideologies
- Linguistic signals or rhetorical choices

Example

In the statement “Students perform better in smaller classes”, the underlying assumption is that class size is the dominant factor influencing student performance. This potentially ignores the differences in teaching methods, pupil motivation, and the quality of the curriculum.

Why Assumptions Matter

Assumptions are not inherently problematic; they are necessary for constructing arguments. However, unexamined or faulty assumptions can:

- Distort reasoning and weaken credibility
- Reinforce bias and exclusion
- Limit the scope of analysis
- Lead to flawed conclusions

Critically engaging assumptions allows writers to deepen their analysis, anticipate counterarguments, and refine their positions.

Exercise: Assumptions

Let’s apply these skills to real academic scenarios. Consider this excerpt from a policy essay: “Urban development is the key to solving the housing crisis.”

Implicit Assumptions:

- The housing crisis is primarily urban.
- Development equals accessibility and affordability.
- Environmental and cultural impacts are secondary.

By surfacing and challenging these assumptions, writers can expand their analysis to include rural concerns, sustainable planning, and community input.

Academic disciplines vary in their assumed values. Historians, economists, and engineers may frame the same problem differently, often based on divergent underlying premises. Engaging with assumptions cultivates interdisciplinary understanding.

4.2 Identifying Assumptions

Academic writers can become more assumption-aware by practicing diagnostic questions:

Ask "What must be true for this claim to hold?" This reveals hidden premises and helps test their validity.

Question an Assumption at a deeper level: What values, ideologies, or worldviews does this statement reflect?

Trace the Chain of Reasoning: Look for gaps between the evidence and the conclusion. What bridges those gaps?

Reverse the Argument: Consider the opposite claim of the assumption. What would need to be assumed for that to be true?

Interrogate the Language: Words like "clearly," "obviously," or "everyone knows" often signal underlying assumptions or biases.

4.3 Questioning and Revising Assumptions in Academic Writing

Once identified, assumptions should be evaluated and revised if necessary to ensure a critical line of reasoning.

Techniques for Revision

Add Qualifiers

- Instead of making absolute claims ("X causes Y"), introduce nuance: "X may contribute to Y under specific conditions."

Integrate Counterexamples

- When you include exceptions, you demonstrate intellectual honesty and depth.

Practice Reflexivity

- When you are the writer, acknowledge your own position and potential bias as the author. This transparency strengthens trust and integrity.

Reframe the Question at Issue

- Shift the perspective. Ask how alternate assumptions might generate different interpretations or conclusions.

Sample Revision Example

Original:

"Remote work reduces productivity."

Revised:

"While some argue that remote work may impede productivity due to isolation or distractions, others highlight increased autonomy, flexibility, and well-being. The relationship between remote work and productivity is likely context-dependent, influenced by individual work styles and organizational support structures."
This revision demonstrates critical engagement, recognizes multiple perspectives, and avoids over-simplified conclusions.

4.4 Special Case: Confirmation Bias

Confirmation bias is a type of implicit cognitive bias, a mental shortcut we unconsciously use that leads us to favour information that confirms our existing beliefs, assumptions, or hypotheses, while ignoring or undervaluing evidence that contradicts them.

In the context of implicit assumptions, confirmation bias is a key mechanism that plays a significant role. It reinforces what we already believe without us realizing it, making it harder to challenge or revise our views. This bias operates beneath conscious awareness, which is why it is so prevalent and difficult to detect.

Classic Examples of Confirmation Bias

News Consumption: A person with strong political inclinations may only read news sources that align with his/her views, dismissing opposing sources as “biased” or “fake.”

Medical Diagnosis: A doctor may form an early hypothesis about a patient’s condition and then focus only on symptoms that support that diagnosis, overlooking contradictory signs.

Sports fans’ perceptions: Fans often believe referees are unfair to their team, interpreting neutral or fair calls as biased against them.

Horoscopes: People interpret vague predictions in ways that match their current experiences, reinforcing their belief in astrology.

Academic Research: A student writing a paper may only cite studies that support their thesis, ignoring those that challenge it.

Confirmation bias isn’t confined to psychology; it’s everywhere. Below are some examples of the presence of confirmation bias across many disciplines.

- In Science, researchers may favour data that supports their hypothesis, risking flawed conclusions.
- In Law Enforcement, investigators may focus on a suspect early in the investigative process and interpret all evidence through that lens.
- In Business, executives may ignore market signals that contradict their strategy, leading to poor decisions.
- In Education, teachers may unconsciously expect certain students to perform better and interpret their behaviour accordingly.
- In Relationships, people may focus on actions that confirm their beliefs about a partner (e.g., “He is always

late”).

- In Finance, investors may seek out news that supports their portfolio choices, ignoring warning signs.
- In social media, algorithms feed users content that aligns with their views, creating so-called “echo chambers”.

Why it Matters

If left unchecked, confirmation bias can:

- Reinforce stereotypes.
- Undermine objectivity.
- Fuel polarization.
- Impede innovation.
- Recognizing confirmation bias is a solid first step toward critical thinking and intellectual humility.

Improving critical thinking isn’t about becoming emotionless or robotic—it’s about becoming more deliberate and curious. The goal is not to eliminate bias entirely (a very difficult goal to attain, given our human nature, which is prone to bias), but to recognize it, question it, and reduce its influence.

4.5 From Idea to Action: Using a Template

Worksheet: "Digging Beneath the Surface – Identifying Assumptions"

Download a copy of this Worksheet template in MS Word (45.8 KB) or PDF (65.5 KB).

Section A: Definitions & Examples

Instructions: Define the following terms in your own words. Then provide an example of each from academic writing or news media.

Term	***Your Definition***	***Example Statement***	***Assumptions Present***
Explicit Assumption		*"Homework improves learning."*	
Implicit Assumption		*"Online classes are more inclusive."*	

Section B: Assumption Spotting

Instructions: Read the statement below. Identify at least one implicit or explicit assumption, then revise it to add nuance or acknowledge alternatives. Use the Chart model above.

"Private schools produce better results than public schools."

Assumption and Revision Chart	
Assumptions:	
Revised version:	

Case Studies

See the link below for a selection of case studies that can be used to identify errors and learn how to correct them. Additionally, the site includes practical exercises to help identify problems in the formulation of ideas.

- Communication Commons: How Logical Fallacies Work

4.6 Chapter Summary

Let's Reflect

Assumptions are the silent architects of argument. By learning to spot, question, and revise them, academic writers transform passive claims into active critical inquiry. Rather than treating assumptions as flaws, this chapter encourages writers to embrace them as opportunities. The close analysis and revision of assumptions are tools for reflection, platforms for deeper analysis, and bridges to a more thoughtful learning experience.

The more we "see the unseen," the more empowered we become—not only as writers, but also as thinkers.

In this chapter, we explored both explicit and implicit assumptions that underpin academic arguments and how to identify them. Assumptions, while necessary for constructing arguments, can weaken reasoning if left unexamined. Strategies for recognizing hidden beliefs, including interrogating language, reversing arguments, and tracing chains of reasoning, were suggested, along with tools for revising faulty assumptions to produce more nuanced and reflective writing.

Additionally, the pervasive role of confirmation bias across disciplines was highlighted, and practical exercises were provided to strengthen awareness of assumptions. Ultimately, the chapter encourages writers to view assumptions not as flaws, but as gateways to deeper inquiry and intellectual growth.

Key Takeaways

- Assumptions are underlying beliefs or premises that support arguments, often operating unconsciously.
- Explicit assumptions are clearly stated, such as hypotheses or thesis statements.
- Implicit assumptions are hidden and shaped by cultural norms, ideologies, or rhetorical choices.
- Assumptions matter because unchecked assumptions can distort reasoning, reinforce bias, and limit critical analysis.
- Writers can reveal assumptions by asking diagnostic questions like “What must be true for this to be valid?” or “What values does this reflect?”
- Revising assumptions involves adding qualifiers, integrating counterexamples, and acknowledging one’s own bias.
- Confirmation bias reinforces existing beliefs and impairs objectivity—it is a key obstacle in academic research and real-world decision-making.
- Recognizing and addressing confirmation bias leads to more balanced, credible writing.
- Practical tools, such as worksheets and case studies, help writers develop assumption-awareness through applied exercises.
- Developing the ability to “see the unseen” transforms academic writing into a process of thoughtful, critical engagement.

Questions for Further Discussion

1. What is one assumption you've recently made in your writing or thinking that you hadn't previously questioned?
2. Can you recall a time when an implicit assumption shaped how you interpreted a text, news article, or classroom discussion?
3. Why do you think implicit assumptions are harder to identify than explicit ones?
4. How might your background, culture, or discipline influence the assumptions you bring to academic writing?
5. Have you ever changed your perspective after recognizing a faulty assumption or bias in your thinking? What triggered the change?
6. How does identifying assumptions in your own writing affect your confidence or credibility as a writer?
7. Why are assumptions necessary for building arguments, and when do they become problematic?
8. In what ways do writers rely on cultural or disciplinary norms as implicit assumptions? Can you give examples from different academic fields?
9. How can questioning assumptions lead to stronger, more inclusive arguments?
10. What role does confirmation bias play in academic writing and research? Why is it so difficult to detect?
11. Do you think it's possible to write completely free of bias or assumptions? Why or why not?
12. How do qualifiers and counterexamples help revise faulty assumptions? Can you think of an example from your own writing or reading?
13. What are the risks of failing to identify or revise faulty assumptions in a policy paper, scientific article, or editorial?
14. How does recognizing confirmation bias make you a more ethical thinker or communicator?
15. Should academic writing include personal bias reflection, or should it strive for full objectivity? What's the value of transparency?
16. How can these skills—questioning assumptions and recognizing bias—be applied outside of the classroom (e.g., in the workplace, relationships, or media consumption)?

Activity: Recognizing and Challenging Assumptions

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

Which of the following best defines an *assumption* in academic writing?

a. A belief or premise accepted as true, sometimes unconsciously
b. A personal opinion stated openly
c. A proven fact supported by evidence
d. A citation from a credible source

2. MultiChoice Activity

What distinguishes *explicit assumptions* from *implicit assumptions*?

a. Both are always clearly visible in the introduction of an essay.
b. Implicit assumptions are always correct; explicit assumptions are often biased.
c. Explicit assumptions are openly stated; implicit ones are hidden or unstated.
d. Explicit assumptions are implied, while implicit assumptions are stated.

3. MultiChoice Activity

Which of the following is an example of an implicit assumption?

a. "Climate change is caused by human activity."
b. Online classes are more inclusive."
c. "Homework improves learning."
d. "This paper argues that remote work reduces productivity."

4. MultiChoice Activity

Why is it important to question assumptions in academic writing?

a. To eliminate all forms of bias
b. To avoid over-citing sources
c. To deepen the analysis and avoid flawed conclusions
d. To make writing more creative

5. MultiChoice Activity

Which of the following revision strategies helps improve assumptions in writing?

a. Removing all opinions from the text

b. Making generalizations for clarity
c. Ignoring counterarguments
d. Adding qualifiers like “may” or “under certain conditions”

6. MultiChoice Activity

Which diagnostic question is useful when identifying assumptions?

a. “Is this a popular topic?”
b. “Is this paper long enough?”
c. “What punctuation does this sentence use?”
d. “What must be true for this claim to hold?”

7. MultiChoice Activity

Confirmation bias is the tendency to ignore information that supports your beliefs and focus only on opposing viewpoints. (True/False)

8. MultiChoice Activity

All assumptions in writing are problematic and should be removed. (True/False)

9. MultiChoice Activity

Words like “clearly” or “everyone knows” may signal the presence of an implicit assumption. (True/False)

10. MultiChoice Activity

Identifying and revising assumptions can help make academic arguments more inclusive and intellectually honest. (True/False)

Quiz Text Description (Answers)

1. a. A belief or premise accepted as true, sometimes unconsciously
2. c. Explicit assumptions are openly stated; implicit ones are hidden or unstated.
3. b. Online classes are more inclusive.”
4. c. To deepen analysis and avoid flawed conclusions
5. b. Adding qualifiers like “may” or “under certain conditions”
6. d. “What must be true for this claim to hold?”
7. False
8. False
9. True
10. True

OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author's own work into ChatGPT. The results were reviewed, edited, and modified by the author:

- Based on the attached content, please create a one-paragraph summary of the chapter as well as a bulleted list of key takeaways.
- Please create a series of questions for reflection and classroom discussion for the attached file.
- Please also create ten multiple-choice and true and false questions for students to check their knowledge.

CHAPTER 5: EVALUATING EVIDENCE IN ACADEMIC READING

Chapter Overview

5.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Define and differentiate between facts, opinions, and various types of evidence (empirical, statistical, testimonial, etc.) used in academic reading.
2. Explain the importance of evaluating evidence for credibility, accuracy, relevance, and purpose using the “bare essentials” framework.
3. Identify credible sources of academic information, including peer-reviewed journals, academic databases, and government reports.
4. Analyze different types of bias (e.g., selection bias, framing bias, ideological bias, etc.) and evaluate how they influence the presentation and interpretation of evidence.
5. Apply principles of academic integrity by incorporating strong evidence into written arguments and constructing logical, well-supported claims.

5.1 Why Evaluating Evidence Matters

Distinguishing Fact from Opinion and Establishing Reliable Support

Academic reading goes far beyond passive consumption. It is a rigorous process of interrogation and selective judgment. Whether you are exploring a textbook, a journal article, or an opinion piece, your goal is to identify which information is factual, which is opinion, and how to distinguish strong support from unreliable material.

The ability to evaluate evidence with knowledge and purpose supports critical thinking and allows informed decision-making. Evaluating evidence also shields a reader against misinformation and persuasive but baseless claims. Correct assessment of evidence enhances the credibility and depth of your writing and arguments. This sounds great, of course, but let's make sure that these claims are clear. We will proceed by defining the pieces of the puzzle.

What is a Fact?

A fact is a verifiable piece of information that can be supported with objective data or reliable sources.

Examples:

- "The Earth orbits the Sun." (Empirically proven.)
- "In 2020, Canada had a population of approximately 38 million." (Cited from census data.)

What is an Opinion?

An opinion is a belief, a judgment, or a perspective that may or may not be supported by evidence.

Examples:

- "Canada has the best healthcare system." (Subjective and debatable.)
- "Shakespeare is the greatest playwright in history." (Subjective, Value-based, not empirically measurable.)

What is Evidence?

Evidence is the information used to support a claim, and it includes:

- Empirical data (from studies or experiments)
- Expert testimony or analysis
- Historical records
- Statistical data

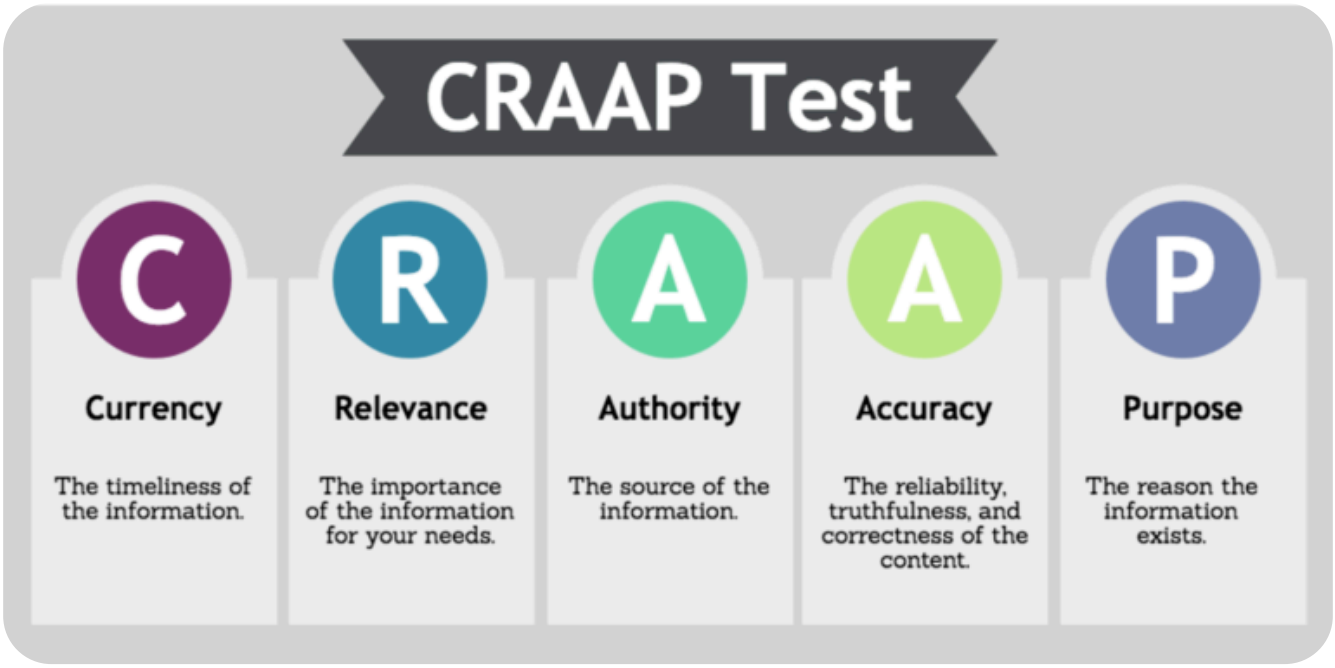
Important Tip!

Remember that when readers or observers are evaluating evidence, they are in fact asking: How well does this support the claim being made?

5.2 Evaluating the Quality of Evidence

The “Bare Essentials” Test: A Practical Framework.

Use this “bare essentials” chart as a quick filter before you accept any evidence into your academic reasoning.



“CRAAP Test” from The Information Literacy User’s Guide: Marietta College” by Linda Lockhart and Peter Thayer, CC BY-NC-SA 4.0

Standard	Guiding Questions
Currency	Is the information up-to-date and relevant to current understanding?
Relevance	Does the evidence directly relate to the argument or topic at hand?
Authority	Who is the author? Is the author credible or an expert in the field?
Accuracy	Can the information be verified with other trusted sources?
Purpose	What is the intention behind the information provided? (inform, sell, persuade, entertain)

Evaluating Statistics and Data

The following sources are strong indicators of reliable data:

- Collected by a reputable institution (e.g., Statistics Canada, WHO, UNESCO)
- Provided with a transparent methodology
- A Peer-reviewed publication

Red flags: Warnings that your data might be unreliable:

- Lack of cited source
- Data taken out of context
- Vague or sensational claims (e.g., “90% of people think…” without any further explanation)

Types of Evidence in Academic Reading

Type of Evidence	Description	Assessment
Empirical	Based on observation or experimentation	Used in Science, especially social sciences
Anecdotal	Personal stories or case studies	Used for Illustrative purposes, but weak as proof
Statistical	Numbers from systematic studies or surveys	Used in Quantitative research
Theoretical	Based on models or concepts	Used in the Humanities and philosophy
Testimonial	Expert opinions	Used to add authority, *especially when cited properly*

Distinguishing Fact from Opinion in Practice

Language Cues

Signal Word	Likely Indicates
“Research shows…”	A fact (but always verify!)
“I believe…” or “It is my view…”	An opinion
“According to the data…”	A factual support
“Should”, “must”, or “best”	Value-laden language → usually an opinion

Let’s Discuss: From Idea to Action

Now let’s jump from idea to action with a sample exercise:

Claim: “Online learning is more effective than traditional classrooms.”

Potential questions to ask:

- What type of evidence is provided?
- Is it personal experience or supported by data?
- Is the study recent, peer-reviewed, and widely accepted?

By examining evidence in this manner, you will develop a healthy skepticism that strengthens your academic integrity.

Now, let’s consider a key issue: the credibility and trustworthiness of our data sources, authoritative analysis, and updated information.

5.3 Sourcing Credible Academic Materials

Where to Look

Peer-Reviewed Journals

Articles reviewed by experts in the field, such as:

- JSTOR, ScienceDirect, PubMed.

Academic Databases

Search tools for scholarly sources, such as:

- EBSCOhost, ProQuest, ERIC

Library Catalogs

Curated university-level resources, for example:

- WorldCat, college and university libraries

Government Reports

Primary data from public institutions, such as:

- census.gov, statcan.gc.ca

How to Check a Source

Always ask yourself the following questions:

- Who wrote it?
- What is the author's background or credentials?
- Who published it (academic press vs. personal blog)?
- Is it cited in other works?
- Does it provide full references?

Remember: credible sources are traceable, contextual, and transparent.

Tip: When Using the Web

Use Google Scholar as a powerful bridge between academic content and the open web.

N.B.: *Consult the Fanshawe College Library Learning Commons for additional support in finding credible resources, as well as assistance with researching and writing.*

5.4 Identifying Weak or Biased Sources

Even well-meaning publications can distort information. Here's how to spot red flags.

Signs of Weak Sources

- Lack of citations in the text.
- Poor grammar or sensationalist headlines.
- No author is named in the text.
- Undue reliance on anecdotal evidence.
- Outdated or Unverifiable Statistics

What is Bias

In Chapter Four, "Seeing the Unseen," we identified a very specific Implicit Assumption, the **Confirmation Bias**, and reflected on how this internal response to external or exogenous factors can lead us to instinctively favour our existing beliefs, values, assumptions and hypotheses while ignoring evidence that contradicts them. However, there are several other types of bias, and in this section, we will define and explain them.

Bias, in its simplest form, is an inclination to lean in a certain direction, often in a way that is not fair or that lacks objectivity. It is of the utmost importance to recognize that Bias can shape our perceptions, judgments, and interactions with people, situations, and ideas. Sometimes, bias can cloud our judgment without us even being aware of it. Some biases are cognitive, rooted in the way our brains process information, while others are ideological, anchored to personal values and/or belief systems.

Let's look then at a brief classification of some of the most common types of bias, other than the confirmation bias.

The Selection Bias

Selection bias occurs when the sample of data or people chosen for analysis is not representative of the overall population, resulting in misleading or flawed conclusions.

Example: If a health study only includes participants from urban areas, it may not accurately reflect health trends in rural regions.

Impact:

- The selection bias undermines the validity of research.
- It can distort the perceived effectiveness of interventions, mediations, involvements, programs, or treatments.
- It can often accidentally influence media and public policy through the dissemination of incomplete data.

Framing Bias

The Framing bias is the tendency to be influenced by how information is presented, rather than just the content of that information.

Example: If a news article says "10% of patients die from this procedure" as opposed to "90% of patients survive," the way the information is framed can affect how readers perceive the risk of the intervention, even though the statistics are the same.

Impact:

- The Framing Bias shapes public opinion and emotional reactions.
- It is mostly used in advertising, politics, and media to steer thinking.
- It can impact decision-making in high-stakes environments, such as healthcare and finance.

Ideological Bias

Ideological bias occurs when an individual's beliefs or ideology influence their interpretation of facts, events, or people, often resulting in a distorted or one-sided perspective.

Example: In news reporting, an article that presents information in a way that favours a particular political ideology (e.g., conservative or liberal) while omitting alternative perspectives exhibits ideological bias.
Impact:

- It generates and promotes polarization, making any attempt at constructive debate more difficult. It also influences academic research, journalism, and education, depending on the dominant ideology in a space.

Experimenter Bias

Also known as researcher bias, this happens when scientists or researchers unconsciously influence their studies to produce desired outcomes.

Example: A psychologist who expects a therapy to work may unknowingly prompt certain behaviours in participants that support their hypothesis.

Impact:

- The experimenter's bias tilts scientific integrity.
- To counter this bias, the work requires safeguards like double-blind testing to mitigate the impact of the experimenter on the work's outcomes.

Anchoring Bias

Anchoring bias is the tendency to rely too heavily on the first piece of information encountered (the "anchor") when making decisions, even if it is irrelevant.

Example: If you see a jacket marked down from $300 to $150, it might seem like a bargain—even if $150 is still more than you'd normally spend on a jacket.

Impact:

- This bias is very common in pricing strategies and business negotiations. It affects judgment in everything from consumer behaviour to legal sentencing.

Groupthink

Groupthink occurs when the desire for harmony or conformity in a group overrides rational decision-making. People suppress dissent to maintain consensus.

Example: In corporate boardrooms, executives may agree with the majority decision to avoid rocking the boat, even if they have valid concerns.

Impact:

- This very human bias limits creative solutions and can lead to flawed policies or disastrous outcomes, especially in crisis situations.

Implicit Bias

Implicit bias refers to attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner.

Example: A hiring manager may favour a candidate whose background or interests mirror his/her own, without realizing he/she should not be judging purely on merit.

Impact:

- It influences workplace diversity, affects judicial outcomes, healthcare treatment, and education equity. The only way to mitigate the effects of this bias is to promote an ongoing awareness of its presence and provide training to reduce it.

Why Bias Matters

Understanding bias is crucial not only in academia and policy-making, but also in everyday life. Recognizing these patterns helps us become better thinkers, more fair-minded communicators, and informed citizens. Whether we're scrolling through news, discussing politics, or making business decisions, bias can creep in subtly but powerfully.

The good news is that we can challenge bias by asking tough questions, seeking diverse perspectives, and being mindful of how we engage with information.

Remember

When in doubt, cross-reference your information with neutral sources.

5.5 Applying these Skills in Academic Work

Incorporating Strong Evidence in Your Writing

When presenting arguments, lead with your claim, follow with factually supported evidence and finally, cite your sources clearly and consistently (*see APA and MLA methodologies*).

Example

- *Claim:* "Income inequality contributes to lower educational outcomes."
- *Support:* "A 2023 OECD (Organization for Economic Co-operation and Development) study found that students in the lowest income quartile scored 18% lower in mathematics compared to peers." (OECD, 2023)

Building a Logical Thread

Make sure the connection between your claim, your evidence and your conclusion is strong and avoid logical fallacies.

Thinking Like an Academic

Evaluating evidence is not just a skill; it is a reliable approach. It requires:

- Intellectual humility (avoid thinking that you know what you do not know)
- Attentive and meticulous work in sourcing and verification
- A persistent and clear desire to establish the truth

By mastering these skills, you will rise above superficial reading and become a thoughtful participant in scholarly conversations. You will not be a gullible, passive part of an audience but a grounded, articulate, and credible participant.

Synthesizing Multiple Sources

When you have been working with multiple sources to address a topic, make sure you identify consensus and debate, compare the methodologies used, and highlight any gaps or inconsistencies that you find in any of the sources being consulted. This not only demonstrates concentrated and meticulous reading but also shows academic maturity.

Your instructor will provide you with readings with which you will be able to put these abilities to the test. Enjoy your reading! It is a powerful adventure, loaded with discovery and valuable knowledge.

5.6 Chapter Summary

Let's Reflect

This chapter focused on developing critical reading skills by teaching you how to evaluate the quality and credibility of evidence in academic texts. It emphasized the importance of distinguishing facts from opinions, recognizing different types of evidence, and identifying bias in information sources. In addition, it introduced practical tools, such as the "bare essentials" test, to assess evidence and guide readers on how to find and verify credible academic materials. It also examines various types of cognitive and ideological biases that can influence reasoning and decision-making. By learning how to incorporate strong evidence into writing and avoid logical fallacies, students become more thoughtful, analytical, and informed participants in academic discourse.

Key Takeaways

- Academic reading is an active process that requires critical evaluation of facts, opinions, and supporting evidence.
- Facts are objective and verifiable, while opinions are subjective and may lack empirical support.
- Strong evidence can come from empirical data, expert testimony, statistics, and theoretical models.
- The "bare essentials" test—currency, relevance, authority, accuracy, and purpose—is a useful tool to assess the quality of evidence.
- Reliable sources include peer-reviewed journals, academic databases, government reports, and library catalogues.
- Common red flags for weak sources include a lack of citations, poor grammar, and sensationalist headlines.
- Understanding and identifying different types of bias (e.g., confirmation, selection, framing, ideological, experimenter, anchoring, groupthink, and implicit bias) is crucial for fair-minded reasoning.
- Effective academic writing requires logical organization, clear claims, solid evidence, and proper citation.
- Synthesizing multiple sources involves comparing perspectives, identifying consensus or debate, and highlighting gaps in information.
- Mastering these skills fosters academic integrity and transforms students into credible, independent thinkers.

Questions for Further Discussion

1. Why is it important to distinguish between fact and opinion in academic reading?
2. Can you think of a time when you accepted information without questioning its credibility? What was the outcome?
3. How would you explain the difference between a fact and an opinion to a younger student?
4. What makes a piece of evidence strong or weak? Can you give an example from a recent reading or media article?
5. How does the “bare essentials” test help you decide whether to trust a source? Which of the five criteria (Currency, Relevance, Authority, Accuracy, Purpose) do you find most challenging to assess?
6. Why is it important to question statistical data? What signs might suggest that the data is misleading or taken out of context?
7. How do you typically find sources for academic work? How can you improve your source selection process?
8. What are some advantages of using databases like JSTOR or PubMed compared to a general web search?
9. Which type of bias discussed (e.g., confirmation, framing, groupthink) do you think has the biggest impact in today’s digital world? Why?
10. How can being aware of your own biases improve the quality of your academic or personal decision-making?
11. What strategies can you use to make sure your arguments are well-supported by credible evidence?
12. How can logical fallacies undermine your writing? Can you identify one common fallacy and explain its effect?
13. What does it mean to have “intellectual humility” in academic reading and writing?
14. How can synthesizing multiple sources strengthen your academic work? What challenges might arise in the process?

Activity: Evaluating Evidence

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

Which of the following is a verifiable fact?

a. Shakespeare is the greatest playwright in history.
b. Social media is ruining communication.
c. The Earth orbits the Sun.
d. Canada has the best healthcare system.

2. MultiChoice Activity

What is the main purpose of the “bare essentials” test?

a. To improve writing style
b. To summarize an article
c. To memorize statistics
d. To assess the quality of evidence

3. MultiChoice Activity

Which source is MOST likely to provide reliable statistical data?

a. An advertisement
b. A peer-reviewed journal
c. A personal blog
d. A social media post

4. MultiChoice Activity

Which of the following is an example of anchoring bias?

a. Believing your political views are always correct
b. Ignoring opposing views in a discussion
c. Trusting a news source because it uses big words
d. Accepting the first piece of information as the most important

5. MultiChoice Activity

What type of evidence is strongest in scientific research?

a. Ideological

b. Testimonial
c. Anecdotal
d. Empirical

6. MultiChoice Activity

A statement that includes value-laden words like “should” or “best” is likely an opinion. (True/False)

7. MultiChoice Activity

Confirmation bias leads us to seek out information that challenges our current beliefs. (True/False)

8. MultiChoice Activity

Peer-reviewed journals are considered a credible source of academic evidence. (True/False)

9. MultiChoice Activity

Groupthink often encourages diverse viewpoints and debate within a group. (True/False)

10. MultiChoice Activity

Framing bias occurs when the way information is presented affects how it is interpreted. (True/False)
Quiz Text Description (Answers)

1. d. The Earth orbits the Sun.
2. d. To assess the quality of evidence
3. c. A peer-reviewed journal
4. d. Accepting the first piece of information as the most important
5. d. Empirical
6. True
7. False
8. True
9. False
10. True

OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author’s own work into ChatGPT. The results were reviewed, edited, and modified by the author:

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CHAPTER 6: ARTIFICIAL VERSUS HUMAN INTELLIGENCE

Chapter Overview

Introductory Note to Chapters 6 and 7

Chapters 6 and 7 are directed explicitly to both instructors and students. They are not merely readers, but are ethically bound agents in a shared intellectual mandate. The increasing degradation of linguistic precision and cognitive perception in personal, academic, and community discourse is not a marginal concern; it is a profound and escalating predicament. This decline compromises not only the integrity of education but also undermines the foundational freedom of thought as a liberty that must be protected with the utmost care.

I realize that these chapters do not offer passive observations. They issue an urgent plea. Both educators and learners must recognize their co-responsibility in reversing the corrosive effects of shallow reasoning, fragmented expression, and diminished dialogue. The stakes are immense: Humanity's ability to think freely, engage meaningfully, and sustain democratic discourse depends on a collective awareness and a concerted effort to restore clarity, depth, and intentionality to how we communicate both in the classroom and in our daily lives.
Noam Chomsky, the famously acclaimed American professor and public intellectual known for his works on linguistics, political activism and social criticism, said: "The fact is that if you have not developed language, you simply don't have access to most of human experience, and if you don't have access to experience, then you're not going to be able to think properly."

And George Orwell, in his revolutionary dystopian novel titled "1984" said: "Once thought corrupts language, language can also corrupt thought."

In this critical moment, neutrality is not an option. The preservation of intellectual freedom requires bold action—and it must begin with a concerted effort by both students and teachers in our classrooms and everyday conversations.

6.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Describe the fundamental differences between human and artificial intelligence.
2. Identify key areas where human intelligence outperforms AI.
3. Explain how the integration of AI into education requires shifts in curriculum design.
4. Evaluate the risks of cognitive offloading.
5. Apply critical thinking skills to assess how human and artificial reasoning can coexist.

6.1 Critical Thinking in the Age of Artificial Intelligence

The age of Artificial Intelligence (AI) is rapidly reshaping the way we think, make decisions, and solve problems. As AI systems become increasingly sophisticated, capable of generating ideas, analyzing data, and even engaging in conversation, the role of critical thinking—traditionally a human domain—demands re-examination. Understanding the interplay between human and artificial intelligence is crucial not only for harnessing the potential of this tool but also for preserving and refining our distinctly human cognitive skills.

Image by Undraw, Undraw License

Key Differences Between Human Intelligence (H.I.) and Artificial Intelligence (A.I.)

Aspect	H.I.	A.I.
Origin	Biological – experiential	Computational–engineered
Learning Mechanism	Intuitive, emotional, experiential	Statistical, data-driven, algorithmic
Flexibility	Highly adaptive across different contexts	Task-specific unless specifically trained
Creativity	Frequently emergent and spontaneous	Pattern-based imitation of previously given examples
Bias AND Emotion	Naturally and spontaneously derived from a response to internal and external factors	None, except that which is fed into it by engineers
Awareness	Conscious, insightful	No self-awareness – goal-driven output

Let's reflect briefly on the content of the chart above.

Artificial Reasoning operates using logic and probability models. It excels at recognizing patterns and handling massive datasets. However, it lacks the human sensitivity that produces nuanced contexts. It can possibly be trained to produce limited shades of perception through the imitation of previously fed human responses to specific cases.

Now, a more important consideration is that Artificial Intelligence cannot reason morally or ethically without having the previous input of human reasoning in case-specific scenarios. It's essential to recognize that human reasoning encompasses emotion, intuition, and moral judgment, and human intelligence is shaped by context, empathy, and individual experience. This enables us to produce what is called abductive reasoning, which is when we make creative leaps based on limited data. Yes, we are prone to cognitive biases, but we are also capable of self-correction and critical reflection.

6.2 Advantages and Disadvantages

What are the advantages of using Artificial Intelligence? Let us take a closer look at a few aspects:

Artificial Intelligence Analysis – Advantages:

- *Speed and scale:* Artificial Intelligence can process immense amounts of data at speeds that would be impossible for humans.
- *Consistency:* From the point of view of long-term consistency in its results, artificial intelligence does not suffer from fatigue or emotional instabilities and can therefore deliver a predictable, consistent and quick analysis for entire days, months or years.
- *Objectivity:* Artificial intelligence should ideally be impartial. However, input data biases can distort the outcome of its responses.

Now, let's take a look at the disadvantages of artificial analysis.

Artificial Intelligence Analysis – Disadvantages:

- *Limited understanding of nuance, humour, ethics, and cultural subtleties*: These can possibly be fed into AI, but the programmers' biases can alter and limit the results. Those results may then lack transparency (the elements of nuance, humour, ethics and cultural subtlety are referred to as "black-box" algorithms).
- *No innate capacity for empathy:* This makes it unsuitable for contexts that require human sensitivity, thoughtfulness and compassion.

Now, we can briefly address the factors that may lead us to prefer human analysis in specific scenarios.

Human Intelligence Analysis – Advantages:

We humans are endowed with a rich contextual understanding of innumerable scenarios and potential cases. We can interpret subtle cues, language tones, intentions, and variable degrees of intensity, and we can address cultural "realities", shifting paradigms and educational, hierarchical and historical differences.

Also, as an essential component of our consciousness, we acquire and nurture values and ethical codes of behaviour that allow us to assess situations with moral and philosophical depth.

As part of our human flexibility and adaptability, we possess an unlimited capability for innovation, which enables us to encourage and endorse original thoughts and develop unconventional solutions. This liberty goes beyond the possibilities of artificial computational analysis.

To maintain an objective and unbiased perspective, we must also consider the comparative disadvantages of a purely human analysis.

Human Intelligence Analysis – Disadvantages:

Yes, it is true. Human analysis can be inconsistent and prone to error. The reason is that we are subject to bias,

stress, and a quite limited cognitive scope. For this reason, we are much slower at processing information, especially where large-scale or high volumes of data are involved.

So, what can we conclude from all the above?

In the realm of Education, we find quickly evolving elements in the way information is classified, analyzed and transmitted. We are living in a time when critical thinking has come face-to-face with artificial intelligence. Consequently, we need to address this development with logic, professionalism and responsibility. To thrive in an AI-integrated world, students need more than just technical know-how. More than ever before, they need critical discernment. In the next section below, you will find a brief description of how our education systems might evolve.

6.3 Impacts

Key Shifts in Curriculum Design

We will need to integrate AI Literacy very early in our school. Countries like Singapore and the UAE are introducing AI concepts in primary education, with an emphasis on ethical use and societal impact. However, we cannot abandon those students who have made it to college and are now caught between zero AI literacy (which they never acquired in their primary years of education) and the current state of Artificial Intelligence's evolution, which demands a greater specific Literacy from people all over the world.

We will need to teach Prompt Engineering, where students must learn how to communicate effectively with AI tools, thereby sharpening both their language and logic skills.

We will also have to embed Critical Thinking across all subjects in post-secondary education. AI literacy shouldn't be siloed in tech classes. Literature, history, and social studies can use AI tools to analyze bias, misinformation, and ethical dilemmas.

Image by Undraw, Undraw License

We must ensure that our future generations continue to prioritize Human-Centred Skills. Creativity, empathy, and moral reasoning are irreplaceable. These must be promoted and emphasized alongside a prudent and intelligently employed AI fluency.

Addressing Risks

Of the greatest importance in all curricular approaches is avoiding **cognitive offloading**. Recent studies have shown that students who rely heavily on AI tools may experience reduced engagement and poorer memory retention. This, coupled with the negative effects of social media on cognitive acquisition and development, is the basis for an urgent call to action that will be formulated in Chapter 7.

Case Study Examples

Cases of Positive Interaction Between Human and AI Reasoning

Healthcare

- *Case Study 1: At Moorfields Eye Hospital in the UK,* a group of Ophthalmologists interacted with AI to analyze 5,000 eye scans per week. It was determined that AI produced a 94% diagnostic accuracy, whereas the human-only intervention produced a 65% diagnostic accuracy (Moorfields Eye Hospital NHS Foundation Trust, 2019; University College London, 2023).
- *Case study 2: At the Mayo Clinic and IBM Watson*, Oncologists determined the existence of Cancer in several patients. AI suggested personalized cancer treatments. This suggestion improved survival rates and reduced side effects (Madson, 2018; Gallagher, 2024).
- *Case Study 3: At the George Eliot Hospital in the UK*, Radiologists examined CT scans and asked for AI input. AI compared the CT scans for cancer, leading to a 27% increase in early-stage detection (NHS England, 2025).

These examples demonstrate how AI can augment, rather than replace, human expertise. Doctors interpret AI outputs, apply ethical judgment, and communicate with patients.

6.4 Final Thoughts

AI is a powerful tool—but it's not a substitute for human judgment. Education systems must prepare students to collaborate with AI, not just use it. In critical fields such as healthcare and justice, the synergy between human and artificial reasoning could start saving lives and shaping revised, fairer outcomes. In a world increasingly shaped by algorithms and machine intelligence, critical thinking remains one of humanity's most vital tools. While AI expands our capabilities, it cannot replace the depth, creativity and nuance of human judgment. The goal, then, is to attain a permanent synthesis, not a supremacy. By understanding both domains, we empower ourselves to ask more informed questions, interpret more insightful insights, and envision more promising futures. What is at risk here is the integrity of the human soul.

Some useful sources for additional reading:

- Teachersguide
- Enrollify
- aiplusinfo
- Cornell University Center for Teaching Innovation
- Educause Article: Ethics Is the Edge: The Future of AI in Higher Education
- Keragon HealthCare Platform
- Stack.AI Platform

6.5 Chapter Summary

Let's Reflect

This chapter examined the crucial differences between human and artificial intelligence, highlighting the importance of reevaluating critical thinking in the era of AI. While artificial intelligence excels in speed, data processing, and consistency, it lacks the emotional depth, ethical judgment, and creative intuition inherent to human reasoning. In addition, the chapter examines both the strengths and limitations of AI and human cognition, illustrating how each brings unique value to problem-solving. It argued that education must evolve by integrating AI literacy and prompt engineering into curricula, while reinforcing human-centred skills such as empathy and moral reasoning. Lastly, through real-world healthcare case studies, the chapter demonstrated the potential of human-AI collaboration and concluded that, instead of replacement, a balanced synthesis of both forms of intelligence is essential for meaningful progress.

Key Takeaways

- Human intelligence is context-rich, intuitive, emotional, and ethically aware, whereas artificial intelligence is computational, data-driven, and task-specific.
- AI offers advantages in processing speed, consistency, and data handling, but struggles with nuance, cultural understanding, and empathy.
- Human reasoning enables creativity, ethical analysis, and flexible problem-solving, but is limited by biases and the slower processing of data.
- Curriculum design must prioritize early AI literacy, prompt engineering, and embed critical thinking across all disciplines.
- Overreliance on AI can lead to cognitive offloading, reducing engagement and memory retention among students.
- Real-world healthcare case studies show that AI can enhance—but not replace—human judgment and expertise.
- The chapter advocates for a synergy between human and artificial reasoning, preparing students to collaborate with AI in a thoughtful and ethical manner.

Questions for Further Discussion

1. In what ways do you personally rely on AI in your daily life, and how has this influenced your thinking or decision-making?
2. Have you ever experienced a situation where human intuition or empathy was more effective than a data-driven approach? What made the human element important?
3. Do you think it's possible for AI to truly understand concepts like ethics or morality? Why or why not?
4. How would you assess your own level of AI literacy? What skills do you think you need to develop to engage critically with AI tools?
5. What concerns do you have about the growing integration of AI in education, healthcare, or other critical fields?
6. Based on the chart comparing human and artificial intelligence, which differences do you think are the most significant for future societal development?
7. Should AI ever be trusted to make autonomous decisions in areas like law enforcement, medicine, or education? Why or why not?
8. How can educators balance the need for AI literacy with the preservation of uniquely human cognitive skills like creativity and empathy?
9. The chapter discusses "cognitive offloading" as a risk. What are some ways students and educators can prevent this in an AI-integrated classroom?
10. After reading the healthcare case studies, do you think AI should be viewed more as a collaborator or a tool? How might this distinction impact professional practice?
11. What role should government or educational institutions play in ensuring equitable access to AI education and tools?
12. If AI is trained on human data, how do we ensure that the data—and by extension, the AI—does not inherit harmful biases?

Activity: Artificial Versus Human Intelligence

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

What term is used to describe the type of reasoning where humans make creative leaps based on limited information?

a. Abductive reasoning
b. Deductive reasoning
c. Predictive reasoning
d. Inductive reasoning

2. MultiChoice Activity

Artificial intelligence is typically:

a. Morally autonomous
b. Intuitive and emotionally responsive
c. Data-driven and algorithmic
d. Aware of cultural nuance

3. MultiChoice Activity

AI systems can develop empathy over time through deep learning. (True/False)

4. MultiChoice Activity

Which of the following is NOT listed as a strength of human intelligence?

a. Moral reasoning
b. Predictable and fatigue-free performance
c. Creative innovation
d. Contextual understanding

5. MultiChoice Activity

Human analysis is immune to inconsistency because of our ability to self-reflect. (True/False)

6. MultiChoice Activity

According to the chapter, which educational skill must be integrated across all subjects to prepare students for an AI-integrated world?

a. Memorization
b. Critical thinking
c. Technical writing
d. Computer programming

7. MultiChoice Activity

One of the main risks of over-relying on AI tools in education is:

a. Increased memory retention
b. Cognitive offloading
c. Enhanced moral reasoning
d. Decreased technological literacy

8. MultiChoice Activity

AI consistently outperforms human experts in every field, including ethics and emotional reasoning. (True/False)

9. MultiChoice Activity

In the healthcare case studies, AI was primarily used to:

a. Conduct patient interviews independently
b. Create new pharmaceuticals without supervision
c. Replace doctors entirely
d. Enhance diagnostic accuracy and support clinical decisions

Quiz Text Description (Answers)

1. a. Abductive reasoning
2. c. Data-driven and algorithmic
3. False
4. b. Predictable and fatigue-free performance
5. False
6. b. Critical thinking
7. b. Cognitive offloading
8. False
9. d. Enhance diagnostic accuracy and support clinical decisions

Appendix: Additional Resources

- Clearer Thinking Podcast: Episode 128: What, if anything, do AIs understand? (with ChatGPT Co-Creator Ilya Sutskever)

OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author's own work into ChatGPT. The results were reviewed, edited, and modified by the author:

- Based on the attached content, please create a one-paragraph summary of the chapter as well as a bulleted list of key takeaways.
- Please create a series of questions for reflection and classroom discussion for the attached file.
- Please also create ten multiple-choice and true and false questions for students to check their knowledge.

CHAPTER 7: THE ERA OF SILENT EROSION

Chapter Overview

Introductory Note to Chapters 6 and 7

Chapters 6 and 7 are directed explicitly to both instructors and students. They are not merely readers, but are ethically bound agents in a shared intellectual mandate. The increasing degradation of linguistic precision and cognitive perception in personal, academic, and community discourse is not a marginal concern; it is a profound and escalating predicament. This decline compromises not only the integrity of education but undermines the foundational freedom of thought as a liberty that must be protected with the utmost care.

I realize that these chapters do not offer passive observations. They issue an urgent plea. Both educators and learners must recognize their co-responsibility in reversing the corrosive effects of shallow reasoning, fragmented expression, and diminished dialogue. The stakes are immense: Humanity's ability to think freely, engage meaningfully, and sustain democratic discourse depends on a collective awareness and a concerted effort to restore clarity, depth, and intentionality to how we communicate both in the classroom and in our daily lives.
Noam Chomsky, the famously acclaimed American professor and public intellectual known for his works on linguistics, political activism and social criticism, said: "The fact is that if you have not developed language, you simply don't have access to most of human experience, and if you don't have access to experience, then you're not going to be able to think properly."

And George Orwell, in his revolutionary dystopian novel titled "1984" said: "Once thought corrupts language, language can also corrupt thought."

In this critical moment, neutrality is not an option. The preservation of intellectual freedom requires bold action—and it must begin with a concerted effort by both students and teachers in our classrooms and everyday conversations.

7.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Explain how language shapes cognition, perception, and critical thinking.
2. Analyze the effects of digital media on vocabulary, literacy, and attention span.
3. Evaluate strategies for restoring expressive language and deep thinking in education.
4. Propose actions to counteract linguistic and cognitive decline in personal, academic, or community settings.

7.1 The Silent Erosion

Image by StockSnap. Pixabay License

In the rapidly accelerating digital age, language, the very vessel of thought, has become a casualty of convenience. Once valued for its nuance, beauty, and power to provoke inquiry, language now risks dilution through the fragmented, fast-paced dialogues that dominate social media. This isn't just a linguistic concern; it's a cognitive one. When words lose precision, ideas lose depth. And when our capacity for articulate expression withers, so does our ability to reflect, critique, and imagine.

We face an urgent cultural challenge: to recover language not simply for habitual communication, but for cognition. Acquiring knowledge and understanding demands not only experience and sensory perception, but also thought. Language provides the framework for organizing and structuring our thoughts. The structure of a language influences the way its speakers understand the world, including their perception of colour, time, and spatial relationships. While language does not entirely dictate thought, it significantly shapes how we perceive, understand, and interact with the world. When language shrinks through loss or a culturally enforced limited exposure, that decline will negatively impact our cognitive abilities and the perception of our surroundings.

We are at a tipping point in the evolution of teaching Languages. Language is more than mere communication. Language is cognition, identity, and imagination. This chapter calls upon educators, policymakers, tech developers, and families to restore the richness of human expression and critical perception in the face of increasing digital randomness and disorder.

The exponential rise in social media dependency has coincided with observable declines in literacy, vocabulary diversity, and critical thinking across younger populations. This section of the book advocates for an integrated, multidisciplinary approach to restoring cognitive depth and expressive competence by reforming key elements of our education, regulating digital media consumption, and promoting a healthy use of language.

We now have clear evidence of language and cognitive decline linked to social media, and we must find ways to counteract what I would call "Digital-Era Cognitive Decline."

Our primary objectives in addressing this issue should be to reverse the decline in literacy, vocabulary, and critical thinking associated with social media overuse, to empower citizens, especially youth, with media literacy and cognitive resilience, and to promote in-depth and thoughtful discourse in educational spheres.

7.2 The Lingering Effects of Linguistic Decline

Cognitive Impairment

Empirical studies reveal that overreliance on abbreviated digital communication contributes to reduced attention span, impaired memory consolidation, and diminished executive functioning (Shanmugasundaram & Tamilarasu, 2023). When young minds grow accustomed to short-form content, the neural pathways that support sustained analysis and synthesis are weakened.

Shrinking Vocabulary

The lexicon used in social media platforms has narrowed dramatically. Emojis replace adjectives. Acronyms replace context. A study by the University of Helsinki, which tracked language use on TikTok and Instagram, found a 30% drop in expressive vocabulary among users aged 13–18 compared to their counterparts in 2005 (Tusa'adah & Djauhari, 2025).

Let's Watch: The Decline of English

Video: "Is English in DECLINE? A Linguist's Perspective | Pt. 1" by Lana Marie [8:58] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Video: "Is English in DECLINE? Gen Alpha, Neopronouns. A linguist's take | pt. 2" by Lana Marie [9:48] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Erosion of Articulate Thought

Modern discourse favours speed over substance. In classrooms, debates are dying. In homes, dinner conversations are replaced by scrolling. The ability to articulate thought, reason, express, and challenge ideas through language is steadily fading, undermining the foundation of critical inquiry.

Language as a Tool of Thought, Not Just Speech

Language is not merely a tool for social interaction. It is the architecture of our inner world. Philosopher Ludwig Wittgenstein once said, "The limits of my language mean the limits of my world." By restricting language to simplistic exchanges, we inadvertently restrict our mental universe. From the ancient dialogues of Plato to the precision of scientific terminology, civilization has thrived on rigorous, nuanced use of words. Language enables abstraction, comparison, empathy, and dissent. Without it, the richness of perception and the vigour of argument will falter.

7.3 Reclaiming Language: A Framework for Renewal

Ideas for Rethinking Langague in Education

Here are a few ideas for rethinking language education:

- We can incorporate media literacy and semantic analysis as core subjects.
- We can mandate weekly sessions in philosophical inquiry, debate, and creative expression to nurture articulate thought.
- As educators, we can train ourselves to revive a deep reading culture in this era of skimming and distraction.
- We can, for the purpose of this topic, redefine what we call “Digital Habits” by advocating for a classroom screen-time threshold grounded in cognitive science.
- We can encourage our students to create dialogue-rich environments in class and at home.
- Reviving public discourse must be a new pedagogical mandate that will allow us to
- Launch local events celebrating expressive language—storytelling festivals, spoken-word showcases, and intergenerational discussion forums.

7.4 A Call for a Linguistic Renaissance

To reclaim language is to reclaim the mind. This renaissance will not happen through silence, nor through censorship, but through deliberate cultivation of words, of meanings, and of minds unafraid to think deeply. We must resist the progressive loss of expression and demand more from our dialogue: more precision, more curiosity, more courage. Because without language, we lose more than communication; we lose contemplation. It is the integrity of our souls that is at stake.

Additional resource for teachers:

- Cornell University Center for Teaching Innovation – Artificial Intelligence

7.5 Chapter Summary

Let's Reflect

This chapter presented a compelling argument that language erosion in the digital age is not just a communication issue but a cognitive crisis. It warns that the rise of social media and short-form digital communication is diminishing vocabulary, weakening attention spans, and undermining the capacity for critical thought. Language, the foundation of cognition, identity, and reflection, is being reduced to simplistic symbols and rapid exchanges, threatening our ability to reason, empathize, and engage deeply. A "linguistic renaissance" through deliberate educational reform, media literacy, and the revival of articulate discourse is needed now more than ever to reclaim both language and thought.

Key Takeaways

- Language is essential not only for communication but also for cognitive development and critical thinking.
- Digital media, particularly social platforms, contribute to a shrinking vocabulary and reduced cognitive depth among young people.
- Abbreviated digital communication weakens memory, attention span, and executive function.
- The erosion of articulate thought is linked to the decline in meaningful conversation and debate in both home and educational settings.
- Language shapes perception and understanding; limited language limits intellectual and emotional depth.
- Reforms in education should include media literacy, philosophical inquiry, and creative expression to rebuild linguistic capacity.
- Educators are encouraged to foster environments that value deep reading, discussion, and expressive language.
- A cultural shift toward celebrating thoughtful discourse is necessary to reverse digital-era cognitive decline.

Questions for Further Discussion

1. In what ways has your own use of language changed as a result of digital communication (e.g., texting, social media, emojis)?
2. Do you agree with the idea that language shapes how we think and perceive the world? Why or why not?
3. How might the decline in vocabulary and critical thinking affect society on a larger scale (e.g., politics, education, civic engagement)?
4. What are the consequences of replacing in-depth conversation with short-form digital exchanges in everyday life?
5. Can you think of a time when precise or thoughtful language helped you better understand a complex idea?
6. How do you feel about the concept of a “linguistic renaissance”? What might that look like in your own community or school?
7. What role should schools play in countering the effects of digital-era cognitive decline?
8. What are some ways students and educators can reclaim thoughtful discourse and deep reading in a technology-driven environment?
9. How can we balance the benefits of digital communication with the need to maintain rich, expressive language?
10. What actions could you take in your own life to strengthen your vocabulary, attention span, or critical thinking skills?

Activity: The Decline of Language

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

What does the chapter identify as a key contributor to the decline in vocabulary and critical thinking?

a. Watching educational videos
b. Overuse of social media and digital communication
c. Traditional classroom instruction
d. Print newspapers

2. MultiChoice Activity

According to the chapter, what does language provide for human cognition?

a. A distraction from technology
b. A framework for organizing and structuring thoughts
c. A way to remember facts
d. A method for memorizing vocabulary

3. MultiChoice Activity

Which of the following is not listed as a proposed educational reform in the chapter?

a. Celebration of expressive language through local events
b. Weekly sessions in philosophical inquiry and debate
c. Screen-time limits based on cognitive research
d. Mandatory foreign language learning

4. MultiChoice Activity

What did a University of Helsinki study find about teens' vocabulary on social media platforms?

a. It increased by 30% compared to 2005
b. It remained unchanged from 2005
c. It dropped by 10% compared to 2010
d. It dropped by 30% compared to 2005

5. MultiChoice Activity

According to the chapter, what happens when language is reduced to simplistic exchanges?

a. Reading comprehension increases

b. The mental universe becomes restricted
c. People become more creative
d. Memory improves

6. MultiChoice Activity

Language plays no role in shaping perception and understanding. (True/False)

7. MultiChoice Activity

Digital-era communication has led to reduced attention spans and impaired memory in younger populations. (True/False)

8. MultiChoice Activity

The chapter encourages silence and censorship as solutions to linguistic decline. (True/False)

9. MultiChoice Activity

The chapter emphasizes that reclaiming language is necessary to restore critical thinking and imagination. (True/False)

10. MultiChoice Activity

The chapter suggests that emoji use enhances expressive vocabulary among youth. (True/False)

Quiz Text Description (Answers)

1. b. Overuse of social media and digital communication
2. b. A framework for organizing and structuring thoughts
3. d. Mandatory foreign language learning
4. d. It dropped by 30% compared to 2005
5. b. The mental universe becomes restricted
6. b. False
7. b. True
8. b. False
9. a. True
10. a. False

Appendix: Additional Resources

- Clearer Thinking Podcast: Episode 128: What, if anything, do AIs understand? (with ChatGPT Co-Creator Ilya Sutskever)

OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
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CHAPTER 8: ANALYZING AND DEVELOPING STRONG ARGUMENTS

Chapter Overview

8.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Describe the cultural impact of persuasion and explain the significance of critical thinking in the context of advertising and artificial intelligence.
2. Identify the essential structural components of a strong argument, including thesis statements, organization, evidence, and counterarguments.
3. Analyze common weaknesses found in weak arguments, such as vague theses or emotional appeals, and explain strategies for improving them.
4. Evaluate argument quality by recognizing stylistic, grammatical, and logical flaws that diminish persuasiveness and credibility.

8.1 The Era of Artificial Intelligence and Persuasion

Image by *Roberto Lee Cortes*. *Pixabay License*

At the beginning of this decade, Canadian Radio hosts Terry O'Reilly and Mike Tennant coined the phrase "The Age of Persuasion" and named it the title of a radio series that they ran successfully from 2006 to 2011 on the CBC, comprising five seasons and 107 episodes. Their very popular program explored the cultural impact of Advertising and Marketing in Capitalist economies and Globalized markets. They systematically illustrated the different elements of successful pieces crafted by different industries around the world in their efforts to prevail in the increasingly competitive sales environments where they had to survive.

To craft a compelling and persuasive argument explaining why someone in a targeted audience should buy something, sales executives in all corners of the world tried every element and tool at their disposal, sometimes with the best of intentions, and sometimes with clearly malicious intent. Manipulation became a primary tool that aided bias and ethically dubious argumentation.

This, of course, has impacted the global market, and consumers have been affected to the point that over-spending, hoarding, and irrational shopping have become prevalent in a world filled with millions of options, often prompting impulsive, unaware, or immature consumers to make choices.

Yes, although I call the present period the Era of Artificial Intelligence as a way to acknowledge the numerous identifiable but also unfamiliar and unpredictable consequences of the generalized use of AI in our daily existence, we still live in an age of profoundly rooted stratagems designed to convince, manipulate, induce, convert, tempt or encourage people to undertake on the spot actions without critical contemplation. Thus, Persuasion continues to be at the heart of human interaction. Artificial Intelligence has now entered this landscape and become a new ally of Persuasion.

This is why it is so important, now more than ever, to analyze arguments and explore how to use evidence, reasoning, and language effectively. When crafting arguments, we are not just stating opinions; we are building a logical fortress supported by evidence and the greatest possible simplicity.

Let's Listen: On Persuasion

Listen to an important discussion about persuasion from the "Clearer Thinking" podcast with Spencer Greenberg:

- Episode 164: Deep canvassing, street epistemology, and other tools of persuasion (with David McRaney)

8.2 The Elements of Argumentation

In this section, we will work on the key structural elements of a successful argument.

Here is a summarized breakdown:

1. A Clear Thesis Statement

- The argument must present a focused and arguable claim (not just a fact).
- The argument should reflect the author's position and preview the context where the argument is applicable.

2. A Logical Organization

(Summarized review of the content from Chapter 3)

A successful argument must include the following elements, without which it would be incomplete:
Introduction: This is where the author establishes a context and presents his/her thesis.

> *Body Paragraphs*: Each of these should focus on a single supporting point and must begin with a topic sentence, include credible evidence (studies, statistics, scholarly opinions), and analyze and explain how the evidence supports the author's claim.
>
> *Conclusion:* It reinforces the author's argument and suggests broader implications or a call to action.

3. Strong Evidence

When you can, use peer-reviewed sources, case studies, or historical examples. (Remember to always cite sources properly using an assigned academic format (APA, MLA, Chicago, etc.).

4. Counterarguments & Refutations

It is advisable to address opposing views to show awareness of the debate which the argument is subject to.
This is also the academic analyst's or the author's opportunity to provide thoughtful rebuttals to strengthen their positions.

5. Clarity and Formal Tone

Always avoid vague language or emotional appeals and maintain an academic voice. Your sentences must express an objective, concise, and focused assessment of the argument or idea being refuted, analyzed, or incorporated.

6. Cohesion and Transitions

Use transitional phrases to link ideas and paragraphs smoothly and make sure the argument flows logically and is easy to follow. Your instructor has given you a lot of information covering these important elements of paragraph building.

8.3 How to (NOT) create Weak Arguments

Let's look at some common weaknesses that can deteriorate a persuasive argument—and reflect on how to avoid them.

The Issues

1. Weak or Vague Thesis

- *Problem*: If your central claim is unclear or overly broad, readers won't know what you're arguing.
- *Fix*: Make your thesis specific and debatable. It should guide your entire essay.

2. Lack of Evidence

- *Problem:* Relying on opinions or anecdotal stories alone.
- *Fix:* Use credible sources and data to support claims. Evidence is your armour.

3. Ignoring Counterarguments

- *Problem:* Pretending opposing views don't exist can make your writing seem one-sided or naïve.
- *Fix*: Address and refute counterpoints to show depth and strengthen your stance.

4. Overuse of Emotional Appeals

- *Problem*: Excessive emotion can be perceived as manipulative or unprofessional.
- *Fix:* Strike a balance between emotional resonance and logical, factual support.

5. Poor Organization

- *Problem:* Arguments jump around, making it hard for readers to follow. They do not follow an order. There is no coherent structure. There is no cohesion between arguments.
- *Fix:* Structure your writing logically—with clear transitions and focused paragraphs.

6. Repetitive Language

- *Problem*: Saying the same thing over and over can wear down your reader's patience.
- *Fix:* Use varied vocabulary and sentence structures to keep it fresh.

7. Tone Discrepancy

- *Problem*: Being too casual or too aggressive can alienate your audience.
- *Fix:* Maintain an academic and respectful tone, especially when tackling controversial issues.

8. Grammar and Style Errors

- *Problem*: Typos, Subject-Verb disagreement, incorrect spelling, inappropriate word choice, and awkward phrasing can undermine credibility.
- *Fix:* Proofread and revise. Let your writing reflect your best self.

8.4 Chapter Summary

Let's Reflect

This chapter explored how to craft strong, persuasive arguments in a world saturated with messaging designed to influence and manipulate. Beginning with the historical context of persuasion and its increasing complexity in the age of artificial intelligence, the chapter emphasized the ongoing relevance of rhetorical skill. It outlined the essential components of effective argumentation, including a clear thesis, logical structure, strong evidence, acknowledgment of counterarguments, and polished writing techniques such as formal tone and smooth transitions. Additionally, it addressed common weaknesses in student arguments—such as vague claims, lack of evidence, emotional overreliance, and poor organization—offering clear strategies for improvement. This chapter encouraged readers to be both analytical and intentional in their communication, especially in academic and real-world contexts where persuasive writing can drive change or clarify truth.

Key Takeaways

- Persuasion remains a dominant force in society, intensified by the rise of Artificial Intelligence, which can now be used to influence decisions.
- Modern marketing strategies often rely on manipulation and emotional appeal, leading consumers to make impulsive choices.
- In an era flooded with persuasive messages, it's essential to analyze arguments critically and construct responses based on logic, clarity, and evidence.
- The key structural elements of a successful argument are a clear thesis statement, logical organization, strong evidence, counterarguments and refutations, clarity and tone, and cohesion and transitions.
- Some common weaknesses that can undermine a persuasive argument include: a vague thesis, lack of evidence, ignoring counterarguments, overuse of emotion, disorganized structure, repetitive language, inappropriate tone, and grammar and style errors.

Questions for Further Discussion

1. How has the rise of persuasive marketing and advertising influenced the way people make decisions today?
2. Do you agree that we are still living in “The Age of Persuasion”? Why or why not?
3. In what ways do you think Artificial Intelligence is now being used to persuade or influence people? Give examples from current media or your own experiences.
4. What makes a thesis statement “clear” and “arguable”? Can you give an example of a strong thesis and a weak one?
5. Why is it important to include counterarguments in your writing, even if you strongly disagree with them?
6. How can transitions and logical organization improve the effectiveness of your argument?
7. What types of evidence do you think are most persuasive to college-level readers, and why?
8. How do tone and language choice affect the credibility of your argument in academic writing?
9. What are some reliable sources you can use when searching for evidence to support your claims in an assignment?
10. Which of the eight weaknesses discussed in this section do you think is most common in student writing? Why?
11. Have you ever received feedback that your writing was “too emotional” or lacked evidence? How did you address this?
12. What strategies can help avoid grammar and style issues that undermine your writing’s effectiveness?
13. Why might ignoring counterarguments weaken an otherwise strong argument?
14. Think about a recent argument or debate you’ve engaged in—what could you have done to strengthen it using what you learned from this chapter?

Activity: Developing Strong Arguments

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

What is the primary purpose of crafting a strong argument?

a. Present personal opinions
b. Convince readers through logic, evidence, and clarity
c. Persuade readers emotionally
d. Avoid addressing opposing views

2. MultiChoice Activity

What does a clear thesis statement provide in an argument?

a. A list of sources
b. Emotional appeal
c. The author's position and the context
d. A summary of the conclusion

3. MultiChoice Activity

Why is it important to address counterarguments?

a. To avoid presenting personal opinions
b. To show awareness of other perspectives and strengthen your stance
c. To confuse the reader
d. To lengthen the essay

4. MultiChoice Activity

Which of the following is a weakness in argumentative writing?

a. Use of transitions
b. Use of scholarly sources
c. Overuse of emotional appeals
d. A formal tone

5. MultiChoice Activity

What is the role of a topic sentence in a body paragraph?

a. To introduce the main point of the paragraph

b. To evoke an emotional response
c. To summarize the conclusion
d. To end the paragraph strongly

6. MultiChoice Activity

Which of the following best describes the tone appropriate for academic arguments?

a. Casual and humorous
b. Sarcastic and critical
c. Informal and friendly
d. Formal and objective

7. MultiChoice Activity

Why is strong evidence necessary in argumentation?

a. It makes the argument sound more emotional
b. It replaces the need for a clear thesis
c. It helps make arguments more controversial
d. It supports claims with credibility and depth

8. MultiChoice Activity

What does logical organization in an argument help with?

a. Ensures clarity and flow from one idea to the next
b. Avoids addressing counterarguments
c. Emphasizes emotional points
d. Hides flaws in reasoning

9. MultiChoice Activity

Which of the following would weaken an argument's effectiveness?

a. Lack of structure and transitions
b. Use of academic format (APA, MLA)
c. Acknowledging opposing views
d. Having a specific thesis statement

10. MultiChoice Activity

What is a common result of ignoring grammar and style in argument writing?

a. It makes the argument stronger
b. It undermines credibility
c. It increases audience sympathy
d. It improves emotional impact

Quiz Text Description (Answers)

1. b. Convince readers through logic, evidence, and clarity
2. c. The author's position and the context
3. b. To show awareness of other perspectives and strengthen your stance
4. c. Overuse of emotional appeals
5. a. To introduce the main point of the paragraph
6. d. Formal and objective
7. d. It supports claims with credibility and depth
8. a. Ensures clarity and flow from one idea to the next
9. a. Lack of structure and transitions
10. b. It undermines credibility

Appendix: Additional Resources

Some resources for debates on current issues designed to explore the "larger picture":

- Communication Commons: The Self-awareness Framework
- YouTube: How to Disagree Productively and Find Common Ground by Julia Dhar
- ProCon: Is Artificial Intelligence Good for Society?
- School of Thought.org: Various educational resources with a critical thinking focus

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OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author's own work into ChatGPT. The results were reviewed, edited, and modified by the author:

- Key Takeaways Prompt: *"Create a chapter summary using a bulleted list for the attached file entitled "Chapter 8: Analyzing and Developing Strong Arguments from the book Critical Thinking in the Age of Artificial Intelligence."*
- Questions for Further Discussion Prompt: *"Create a series of questions for reflection and classroom discussion for the attached file entitled "Chapter 8: Analyzing and Developing Strong Arguments from the book Critical Thinking in the Age of Artificial Intelligence."*

CHAPTER 9: CRITICAL READING

Chapter Overview

9.0 Learning Objectives

Learning Objectives

By the end of this chapter, you will be able to:

1. Identify the explicit or implied thesis in prompts by isolating directive verbs, the debatable focus, purpose/subject, and scope.
2. Apply a conversion process to turn issues into yes/no questions and rephrase them into defensible thesis statements within defined bounds.
3. Analyze arguments using the Claim–Evidence–Reasoning framework to judge credibility, relevance, and logical coherence.
4. Construct counterarguments that address competing claims and evidence in policy and ethical debates.
5. Apply the step-by-step prompt-breakdown method to develop clear positions on real-world topics.

9.1 Applying Critical Thinking to Real-World Decision-Making

Critical reading is more than just understanding words—it's about decoding meaning, evaluating arguments, and making informed decisions. This chapter equips you with tools to identify thesis statements, dissect arguments, and apply critical thinking to academic and real-world contexts.

Let's Watch: Cultivating Thoughtful Analysis

To begin your journey, watch these videos that provide a comprehensive walkthrough of how to slow down your judgment, ask better questions, and build a mindset for thoughtful analysis:

Video: "4 tips for developing critical thinking skills | Steve Pearlman, Ph.D. | TEDxCapeMay" by TEDx Talks [17:38] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Video: "5 tips to improve your critical thinking – Samantha Agoos" by TED-Ed [4:30] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Four Core Skills Of Critical Thinking That Have To Be Applied To Active Reading

1. Detailed Analytic Observation.
2. Complex Question Clarification.
3. Multi-variant Evaluation.
4. Drawing Complex Conclusions

9.2 Spotting the Thesis in Essay Prompts

Identifying the thesis in a writing prompt is the first step toward crafting a compelling analysis, counterargument, or agreement piece. Use these strategies:

Step #1. Isolate the Action command implicit in the thesis statement

- **Look for directive verbs**: argue, evaluate, justify, analyze, defend, propose. These signal the type of response expected.

Step #2. Find the Debatable Focus

- Prompts often center on issues with multiple viewpoints.
- Keywords like “should”, “must”, and “impact”, indicate controversy.
- Consider that a thesis always revolves around a claim you could reasonably agree or disagree with. Look for phrases that suggest tension or debate, like “to what extent,” “should,” “is it justified,” or “is effective.”

Step #3. Break down the Purpose and the Subject

- **Purpose:** Does the author want to persuade, inform, or compare?
- **Subject:** What concept, policy, or trend is under discussion?
- **Ask yourself:** “What is the central idea that the essay is built around? What does the prompt want me to prove or challenge?”

Step #4. Temporarily convert the thesis into a Yes/No Question

Example:

- **Prompt:** Should college tuition be free?
- **Question:** Should governments fund universal college education?

Step #5. Then rephrase the issue as a Debatable Statement

Example: College education should be government-funded to improve social equity and economic growth.

Step #6. Watch the text for Implied claims and take note of them separately

- **Example Prompt:** Discuss the impact of social media on teen mental health
- **Implied claim:** Social media significantly affects teen mental health.

Step #7. Scan the text to establish its scope

- **Note any limits:** of time, of population, of region, of ethnicity, of gender, of belief.
- Your counter-potential counter-arguments or thesis must stay within the established bounds.

How Are Arguments Built?

Let's use the following sequence for dissecting arguments: *Claim–Evidence–Reasoning*. Understanding how arguments are built will help us evaluate their strength.

Claim – The Core Statement

- What is the author trying to prove?
- What is the thesis statement, or what are the topic sentences?

Evidence – The Support System

- Facts, statistics, expert opinions, anecdotes.
- Ask yourself: Are they credible? Relevant? Varied?

Reasoning – The Logical Bridge

- How does the evidence support the claim?
- Watch for transitions like "this shows that..." or "therefore...".

9.3 Practical Exercises for The Classroom

Let's now engage in the contemplation, examination and assessment of events, issues and elements taken from our everyday occurrences.

A. First Sample Prompt

> Should governments ban single-use plastic products to reduce environmental pollution?

Now, let's apply the steps we have previously mentioned:

Step-by-Step Argument Analysis Breakdown

1. *Look for the Task Directive*
    - The verb here is "should" – This tells us the essay is asking for an argumentative stance.
2. *Identify the Controversial Element*
    - The phrase "ban single-use plastic products" is a policy issue that sparks considerable debate. It is controversial due to concerns regarding economic, environmental, and consumer convenience.
3. *Examine the Prompt's Focus*
    - The primary focus is on the connection between government bans and reductions in environmental pollution.
4. *Break Down Multi-Part Prompts*
    - This one is simple and single-layered—no sub-questions—so you can zero in on the policy vs. impact angle.
5. *Rephrase as a Thesis Statement:*

> Governments should ban single-use plastic products because such policies significantly reduce environmental pollution and promote sustainable consumer habits.

Now you have a focused thesis that is defendable with evidence.

B. Second Sample Prompt

> *Topic:* School Uniforms Should Be Mandatory in Public Schools
>
> *Paragraph*: Requiring school uniforms in public schools helps reduce socioeconomic disparities among students. A study by the National Association of Elementary School Principals found that schools with uniform policies reported fewer incidents of peer pressure related to clothing brands. This evidence suggests that uniforms create a more level playing field, minimizing distractions caused by visible income differences and allowing students to focus more on academics and personal development."

Argument Analysis Breakdown

Claim: School uniforms help reduce socioeconomic disparities. This is the main idea the writer is trying to prove.

Evidence: A Study by the National Association of Elementary School Principals (NAESP) showed fewer peer pressure incidents. It is factual support pulled from a reputable source.

Reasoning: Uniforms level the playing field and reduce distractions. The writer explains why the evidence supports the claim—connecting peer pressure to income visibility.

Now, let's look at a possible counterargument paragraph:

> Mandating school uniforms in public schools may suppress student individuality and self-expression, which are crucial during formative years. According to a report by the American Civil Liberties Union, uniform policies can disproportionately impact students' ability to express cultural, religious, or personal identities. While uniforms may aim to reduce visible inequalities, they can unintentionally stifle creativity and diminish students' sense of autonomy—qualities that are essential for developing confident, independent thinkers.

Claim: Uniforms suppress individuality and self-expression. This challenges the original claim by highlighting a potential negative consequence.

Evidence: ACLU report on cultural/personal identity restrictions. This support adds legitimacy and points to broader societal concerns.

Reasoning: Uniforms can hinder personal development and autonomy. This line of thought connects the evidence to the broader educational values being affected.

C. Third Sample Prompt

> *Topic:* Four-Day Workweek
>
> *Academic/Persuasive text:* Implementing a four-day workweek can increase productivity and improve employee well-being. A report by the Organization for Economic Cooperation and Development (OECD) shows that countries with shorter average workweeks tend to rank higher in worker satisfaction and output per hour. By reducing burnout and promoting a better work-life balance, the four-day model enables companies to retain talent and enhance performance.

Claim: Four-day workweek boosts productivity and well-being. This is the central assertion the writer is arguing for.

Evidence: OECD report comparing countries' workweek lengths and outcomes. This report provides credible support for the claim, backed by factual data.

Reasoning: Shorter workweeks reduce burnout and improve retention and performance. The line of thought here explains how the evidence logically supports the claim.

D. Fourth Sample Prompt

Let's now dive into an emotionally charged, policy-centred passage and break it down. This one leans on pathos while still playing a part in public discourse (Emotional appeal and Policy debate)

> Banning animal testing in the cosmetics industry isn't just a matter of ethics—it's a matter of compassion. Behind every mascara wand and lipstick tube may lie the suffering of rabbits, mice, and other sentient beings subjected to painful procedures. Humane alternatives now exist, making this cruelty not only unnecessary but barbaric. Countries like Norway and the UK have already enacted bans, proving that beauty doesn't need to come at the cost of life.

Argument Analysis Breakdown

Claim: Animal testing in cosmetics production should be banned. This represents a central policy position grounded in both ethical and practical reasoning.

Evidence: The existence of humane alternatives with examples of countries that have banned the practice. This kind of support offers real-world validation and leaves an open door to technological feasibility.

Reasoning: Testing is cruel and avoidable; bans by other countries prove the feasibility. The argument provides an emotional and logical connection between ethics, suffering, and legislative action.

An additional note regarding Emotional Appeal in this case: The writer employs emotionally vivid imagery (“suffering… mascara wand… barbaric”) to evoke empathy and moral urgency, making the argument not just logical but also visceral.

Vocabulary isn’t just decoration in persuasive writing—it is the fuel that can add emotional impact, credibility, and clarity. Choosing the right words can mean the difference between convincing your audience and losing their attention.

9.4 Thinking Critically Demands Reading Deeply

Critical reading isn't passive—it's active, analytical, and transformative. By mastering thesis identification, argument analysis, and vocabulary precision, you become a more persuasive writer and a sharper thinker. Ready to apply these tools to your own writing or debate?

Vocabulary isn't just decoration in persuasive writing—it's the fuel that powers emotional impact, credibility, and clarity. Choosing the right words can mean the difference between convincing your audience and losing their attention.

Why Vocabulary Choice Matters in Persuasive Argumentation

1. Precision Builds Authority

- *Impact:* Using specific terminology demonstrates that you're informed and serious.
- *Example:* Using "carbon emissions" instead of "pollution" makes your argument more targeted and technical.

2. Tone Shapes Perception

- *Impact:* Words set emotional and intellectual tone—formal vs. casual, aggressive vs. diplomatic.
- *Example:* "Challenge" feels constructive, while "attack" feels hostile.

3. Emotional Resonance Enhances Engagement

- *Impact:* Carefully chosen emotive language can stir empathy or urgency.
- *Example:* Saying "innocent lives" instead of "people affected" elicits a stronger emotional reaction.

4. Word Connotation Influences Bias

- *Impact:* Connotations subtly influence reader alignment.
- *Example:* "Government interference" vs. "regulatory protection" suggest opposite attitudes toward the same action.

5. Rhetorical elegance adds persuasion

- *Impact:* Strong verbs, analogies, and figurative language enhance persuasive rhythm and leave lasting impressions.
- *Example:* "The system is crumbling like sandcastles in the tide."

Tips for Mastering Vocabulary in Persuasion

- Use a thesaurus with care—only swap in words you truly understand.
- Test your writing by reading it aloud—do the words sound compelling or clunky?
- Keep your audience in mind—vocabulary should fit their background and expectations.

9.5 Chapter Summary

Let's Reflect

Critical reading, this chapter argued, is an active practice of slowing judgment, decoding meaning, and making defensible decisions—not just absorbing words. As you reflect, focus on three anchor skills you developed: (1) spotting the thesis in a prompt by isolating the directive verb, the debatable focus, and the scope—then converting the issue into a yes/no question and rephrasing it as an arguable claim; (2) analyzing arguments with the Claim–Evidence–Reasoning framework to test the credibility, relevance, and logic of support; and (3) building counterarguments that engage opposing claims and evidence with fairness.

Key Takeaways

- Locate the directive verb, the debatable focus, the purpose/subject, and the scope to understand what the prompt truly asks.
- Temporarily convert the issue into a yes/no question, then rephrase it as a clear, defensible thesis that stays within the prompt's stated bounds.
- Note implied claims and constraints (time, population, region) so your response remains precisely targeted.
- Practice breaking down sample prompts (e.g., plastics bans, school uniforms, four-day workweek, animal-testing bans) using the Claim–Evidence–Reasoning sequence.
- Judge evidence for credibility and relevance, and make the logical bridge explicit—show how each piece of evidence supports the claim.
- Build fair counterarguments that acknowledge trade-offs (e.g., equity vs. expression, ethics vs. feasibility) to strengthen your overall position.
- Critical reading is an active process: you decode meaning, analyze arguments, and make informed decisions rather than passively absorbing the text.
- Mastering thesis identification, CER analysis, and precise vocabulary choices elevates clarity, credibility, and persuasive force.
- Using these tools enables you to transition from surface-level reading to deliberate, defensible judgment in both academic and real-world contexts.

Questions for Further Discussion

1. Take a prompt from one of your current courses. Identify its directive verb, debatable focus, purpose/subject, and scope; then convert it to a yes/no question and rephrase it as a defensible thesis
2. Where might readers infer implied claims in that prompt? List one implied claim and explain how it would shape your thesis or boundaries.
3. Share your thesis with a partner: does it stay within the prompt's limits (time/population/region, etc.)? If not, refine it and justify the change.
4. Choose one sample topic (single-use plastics, school uniforms, four-day workweek, or banning animal testing). Identify the claim, the evidence used, and the reasoning that links them; then rate the credibility/relevance of the evidence.
5. Draft a counterargument to the position you analyzed. What alternative evidence or values does it emphasize, and how would you respond to that counterargument in a revised paragraph? (Use the uniforms example for inspiration.)
6. For the animal-testing passage used in this chapter (prompt sample 4), identify the elements of emotional appeal (pathos) and explain how they interact with facts. When is emotive language appropriate in academic writing, and when might it undermine reasoning?
7. Highlight two reasoning transitions (e.g., "therefore," "this shows that…") in a paragraph you've written. Explain whether the logic actually follows. Revise at least one sentence to make the reasoning explicit.
8. Reflect on your own process: where do you most often struggle—finding the thesis, evaluating evidence, or articulating reasoning—and what concrete step will you try next time (e.g., yes/no conversion, source credibility check, adding a reasoning sentence)?
9. Revise a recent paragraph by adjusting vocabulary for precision, tone, and connotation (swap a vague term for a specific one; soften or intensify tone as needed). Explain how each change affects reader perception.
10. In one sentence, state how critical reading changes the way you approach assignments this term; then name one concrete habit you'll adopt (e.g., prompt-mapping, CER outline before drafting).

Activity: Critical Reading

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

What is the first step in identifying the thesis of an essay prompt?

a. Check for emotional language
b. Isolate the directive verb or action command
c. Summarize the author's evidence
d. Look for the conclusion of the essay

2. MultiChoice Activity

Which of the following keywords most likely signals a debatable focus in a prompt?

a. Clearly
b. Quickly
c. Should
d. Always

3. MultiChoice Activity

Which question represents the process of converting a thesis into a yes/no format?

a. Should governments fund universal college education?
b. Who pays for college tuition?
c. How long should college tuition last?
d. Why is college tuition expensive?

4. MultiChoice Activity

In the Claim–Evidence–Reasoning (CER) framework, what does "Reasoning" represent?

a. The factual details used to support the claim
b. The logical bridge that connects evidence to the claim
c. The counterargument
d. The thesis statement itself

5. MultiChoice Activity

Which of the following is evidence in the CER framework?

a. A thesis rephrased as a question

b. Statistics from a government report
c. A persuasive conclusion
d. The author's main claim

6. MultiChoice Activity

In the school uniform example, which of the following represents the counterargument's main claim?

a. Uniforms reduce socioeconomic disparities
b. Uniforms suppress individuality and self-expression
c. Uniforms create a level playing field
d. Uniforms improve student focus

7. MultiChoice Activity

According to the four-day workweek prompt, what was the OECD evidence used to support the claim?

a. Case studies of companies in the technology sector
b. Countries with shorter workweeks ranking higher in worker satisfaction and output per hour
c. Employee surveys about job satisfaction
d. Reports from employers about reduced costs

8. MultiChoice Activity

In the animal testing prompt, what rhetorical strategy strengthened the ethical argument?

a. Technical vocabulary
b. Statistical evidence
c. Counterargument refutation
d. Emotionally vivid imagery

9. MultiChoice Activity

Which of the following best illustrates how vocabulary choice affects persuasive writing?

a. "Regulatory protection" vs. "Government interference"
b. "Book" vs. "Novel"
c. "Table" vs. "Desk"
d. "Blue sky" vs. "Sunny day"

10. MultiChoice Activity

What is the overall purpose of critical reading, as emphasized in this chapter?

a. Actively analyzing, evaluating, and transforming arguments
b. Accepting claims without questioning
c. Memorizing key vocabulary words
d. Quickly summarizing the author's ideas

Quiz Text Description (Answers)

1. b. Isolate the directive verb or action command
2. c. Should
3. a. Should governments fund universal college education?
4. b. The logical bridge that connects evidence to the claim
5. b. Statistics from a government report
6. b. Uniforms suppress individuality and self-expression
7. b. Countries with shorter workweeks ranking higher in worker satisfaction and output per hour
8. d. Emotionally vivid imagery
9. a. "Regulatory protection" vs. "Government interference"
10. a. Actively analyzing, evaluating, and transforming arguments

Appendix: Additional Resources

- YouTube: The Sagan Series is an educational project working in the hopes of promoting scientific literacy in the general population.

OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author's own work into ChatGPT. The results were reviewed, edited, and modified by the author:

- Key Takeaways Prompt: *"Create a chapter summary using a bulleted list for the attached file entitled "Chapter Nine: Critical Reading."*
- Questions for Further Discussion Prompt: *"Create a series of questions for reflection and classroom discussion for the attached file entitled "Chapter Nine: Critical Reading."*

CHAPTER 10: CREATIVITY AND CRITICAL THINKING

Chapter Overview

10.0 Learning Objectives

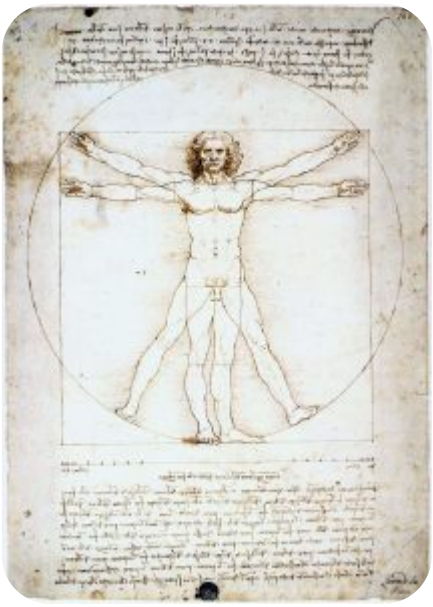
Learning Objectives

By the end of this chapter, you will be able to:

1. Define convergent and divergent thinking to explain how each supports different phases of critical thinking and problem-solving.
2. Analyze when to shift between convergent and divergent modes to move from “right answer” habits toward “rich thinking.”
3. Apply divergent thinking strategies to collaboratively invent a coherent fictional world (e.g., environment, culture, technology, challenges).
4. Identify each step of the SCAMPER technique and its purpose in design thinking.
5. Analyze complex civic or scientific issues (e.g., abortion legislation or climate change) using the 5W+1H framework to extract main ideas and evidence.
6. Develop a reasoned proposal (e.g., policy brief, action plan, or argument) that integrates creativity with logical reasoning and respectful dialogue.

10.1 On Creativity: An Introduction and Conclusion

Very soon, most fields of human endeavour will be shaped in varying degrees by different forms and adaptations of artificial intelligence. This will lead to profound transformations in human perception and thought, and of course, those transformations will affect Creativity and Innovation.



"Vitruvian Man" by Leonardo da Vinci, Public Domain.

Let's remember that *creativity* is the ability to produce original ideas or to create or design something original through the use of our *imagination*. Consider also that our imagination is a Cognitive Process that involves forming mental pictures, sensations, or concepts of things that are not perceived by our senses, but that allow us to create entirely new ideas, reimagine past ideas and experiences, and consider different alternatives to our current reality.

This flexible internal process has been essential for problem-solving, creativity, emotional well-being and for our ability to integrate new experiences into our existing knowledge without trauma.

When I was growing up in New York City, and to celebrate my seventh birthday, my father gave me a present that changed my young life: A quite imaginative, descriptive and well-illustrated book titled, *The Answer Book: The power of asking the right Questions...the Power of looking for the best possible Answers*.

Then, many years later, after working at an International Congress on Stress with Doctor Rosie Manickam, a research assistant of famed Canadian endocrinologist and scientist, Doctor Hans Selye, I received a lovely gift from her in the form of a copy of one of Doctor Selye's most extraordinary books. Selye is considered the "Father" of the field of STRESS research in medicine, and the book is titled *From Dream to Discovery; On Being a Scientist*", published in 1964.

In it, Selye addresses the idea that we should all do research. That we should all ask basic, essential questions about everything. That we should all possess the humility, the strength of character and the knowledge to address our own flaws and satisfy our thirst for truth, for dignity, and for the search for happiness.

In the introduction to this exciting journey through the mind of a scientist and the way it works, Dr. Selye writes that he has categorized the questions we should all formulate into six groups:

1. Why
2. Who
3. What
4. When
5. Where
6. How

The sixth is, of course, the most all-embracing category of problems. The one that includes general

assumptions, possible rules, experimental designs, theories, and the logic, statistics and intuition that should go into the critical evaluation of results.

Although Artificial Intelligence operates on the basis of pattern recognition, data processing, and even the impression of what appears to be a creative output, it lacks the subtle shades of meaning and expression that create elegance, complexity, and that circumstantial and often unpredictable spark of human creativity that distinguishes our species.

This touch of undisguised humanity honours the evolution of the human lineage that began about 7 million years ago and led to the emergence of Homo Sapiens around 300,000 years ago. Our modern and more complex behavioural patterns have flowered into complex technologies and cultural patterns that pose new possibilities and several challenges to our very survival.

This chapter examines the crucial role of creativity in critical thinking—especially as we navigate a world where machines can "think," but not truly imagine. They can delve into millions of bytes of information, yet they are unable to participate in the exclusive human experience of cognition.

Creativity is not merely the domain of artists or inventors; it is an intellectual force that fuels innovation, problem-solving, and adaptability. When paired with critical thinking, creativity becomes a strategic tool for questioning assumptions, generating novel solutions, and resisting intellectual complacency. In the age of AI, where algorithms can offer answers but not always insight, the human capacity for creative reasoning is more essential than ever.

This chapter invites you, dear reader, to examine how creativity enhances critical thinking, how AI challenges and complements this dynamic, and how individuals can cultivate these skills to remain agile, ethical, and visionary in a rapidly evolving, yet human landscape.

Let's Watch: A Closing Video-prompt

Video: "4 tips for developing critical thinking skills | Steve Pearlman, Ph.D. | TEDxCapeMay" by TEDx Talks [17:38] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Key areas to consider:

1. Perceive your environment
2. Sense danger vs. reward
3. Decide between danger and reward
4. Act on the decision

10.2 Convergent vs. Divergent Thinking

Let us undertake a task that proposes that our introductory writing curriculum classroom at Fanshawe College (*known as WRIT: Reason and Writing*) is not limited to our present in-person explorations into the world of Socratic thought and exhaustive methodical scrutiny of issues, questions, answers, problems, ideas and mental recreations.

Let us accept that, as a result of our writing studies, we have created a *space* for true exploration and acquisition of new perspectives by re-thinking and exploring beyond the linear reasoning of a step-by-step, sequential, and logical thought process where each step builds on the previous one, leading directly to a "solution".

Let's Watch: Convergent vs. Divergent Thinking

Let's watch this short video that will illustrate why we need to use both Convergent and Divergent thinking to trigger the highest qualities in our intellectual processes.

Video: "Convergent vs. Divergent Thinking" by Professional & Executive Development – Harvard DCE [3:39] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Let's Watch: Creativity and A.I.

Now, what does creativity entail, and why is Artificial Intelligence not sufficient to satisfy our scientific thirst for mental flexibility and logic? You will find many valid answers here:

Video: "How to be a creative thinker | Carnegie Mellon University Po-Shen Loh" by EO [14:55] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Among the changes we must introduce to find a *new intelligence* that can satisfy the answers our *new world* demands of us is the shift from "Right Answer" to "Rich Thinking". In other words, we need to move away from convergent thinking (one correct answer) and toward valuing *the process of exploration* and idea generation.

When embracing a model of Divergent Thinking, what we do is we:

- share our own brainstorming processes,
- we illustrate how we tackle problems creatively, and

- we think aloud when exploring multiple solutions.

I encourage you to reflect on your thought processes, challenges, and breakthroughs. This builds **metacognition** and helps you recognize your own creative growth.

10.3 A Divergent Thinking Model

Now, let's get to work on a model that will allow us to use our Divergent Thinking: We will call this task: **"**Invent a New World**."** This subject is multidisciplinary; it can be adapted for language arts, social studies, science, or art.

Duration: From 60–90 minutes to 120 minutes.

Objective: You will use divergent thinking strategies to collaboratively invent a fictional world, exploring creativity, problem-solving, and collaboration.

Learning Goals: As a result of this task, you will

1. engage in creative exploration and the generation of ideas,
2. practice using **the SCAMPER** (*See Section II*) method for design thinking and mind mapping.
3. develop collaboration and communication skills with your peers, and
4. reflect on the creative process and the value of multiple perspectives.

Materials Needed:

- The class Whiteboard or a digital board on your laptops.
- Chart paper or large poster paper.
- Markers and sticky notes.
- Your student WRIT notebooks.
- Optional: tablets or laptops for research and drawing.

Lesson Breakdown

1. Warm-Up (10 min) – "What if..." Brainstorm

At your table, each student will pose open-ended prompts like:

- "What if gravity only worked half the time?"
- "What if animals could vote?"

People at your table will write or share as many ideas as possible in 3 minutes (*As many ideas as you possibly can. Never mind the quality for now – no judgment!*).

2. Your instructor will quickly repeat the intro Video to Divergent Thinking and...

- Briefly summarize the difference between divergent and convergent thinking.
- Introduce the SCAMPER method and mind mapping.
- Show you a quick example: redesigning a backpack using SCAMPER.

3. Main Activity (30–40 min) – Invent a New World

At your tables, you will:

- Create a fictional world using a mind map.
- Include environment, creatures, culture, technology, and challenges.
- Use SCAMPER to evolve ideas (e.g., "What if we eliminate gravity?").
- Encourage wild ideas—no limits!
- Each group will present their world in a 2-minute pitch.

4. Reflection (10–15 min) – Creative Journaling

- You will all respond to the Prompt: "What surprised you about your thinking today?"
- Reflect on how you contributed to the group, what you learned, and how it felt to think freely.

5. Extension (Optional Homework or Follow-Up)

- Write a short story set in the invented world. (6-8 paragraphs)
- Create a visual map or flag for the world.
- Research *real-world inventions* that started with wild ideas.

Tips for Success

- Let's celebrate unusual ideas and humour with respect and professional courtesy.
- Avoid correcting or steering ourselves toward "realistic" answers.
- Use our collective ideas to spark further questions and more exploration.

The most important trait for success in the Era of Artificial Intelligence: *be your own writer, until you can*

master logic and argumentation and at the same time, grow, defend and strengthen your very own human intelligence.

Let's Watch: Humanity, Teamwork and Survival

Please watch what Professor Po-Shen Loh says about Humanity, teamwork and survival in the age of Artificial Intelligence:

Video: "The Only Trait for Success in the AI Era—How to Build It | Carnegie Mellon University Po-Shen Loh" by EO [22:31] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

10.4 The Scamper Technique for Design Thinking

The **Scamper method** is a structured template for brainstorming and generating ideas. The name comes from the acronym for *Substitute-Combine-Adapt-Modify-Put* and adds *Eliminate and Reverse*. The idea is to prompt creative thinking about an existing problem, product, service or idea.

By asking questions related to each of the seven elements of the Template, individuals and teams can methodically explore innovative responses and new possibilities, make improvements or completely reinvent models, solutions, inventions and offerings.

Let's Watch: The Scamper Method

Let's look at the tools we now have by taking notes from these videos:

The Scamper Technique Explained

Video: "The Scamper Technique Explained" by INSPIRATION FOR INNOVATION [4:43] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

The Scamper Technique

Video: "Scamper Technique [BEST IDEA GENERATION METHODS]" by Adriana Girdler [7:55] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

10.5 Case for the Classroom - Debate on Abortion Legislation

Practical Activities to Combine Creativity with Logical Reasoning in Problem Solving

Designing an educational solution to many pressing issues in today's world demands a thoughtful, inclusive, and balanced approach that fosters critical thinking, empathy, and civic engagement. Here's a comprehensive framework for classroom-based educational modules:

A. Understanding the Debate on Abortion Legislation

Educational Module: "Understanding the Debate on Abortion Legislation"

Target Audience: College students

Subject Areas: Civics, Ethics, Law, Health, Sociology

Duration: 1–2 three-hour sessions (can be condensed or expanded)

Learning Objectives

- Explain the historical, legal, ethical, and medical dimensions of Abortion
- Describe diverse perspectives on abortion legislation
- Develop skills in respectful debate, critical analysis, and policy design
- Apply civic engagement and informed decision-making

Module Structure

Foundational Knowledge (First 2 hours)

1. Introduce key concepts:

- *Definitions:* abortion, reproductive rights, bodily autonomy, viability
- *Legal history:* Roe v. Wade, Dobbs v. Jackson, Canadian abortion law
- *Global perspectives:* abortion laws in different countries
- *Possible Activities:* Timeline creation of abortion legislation milestones or a comparative chart of abortion laws across countries

Ethical and Social Perspectives (third and fourth hours)

2. Explore moral arguments and societal impacts:

- Pro-choice vs. pro-life frameworks
- Religious, cultural, and feminist viewpoints
- Public health and socioeconomic implications
- *Possible Activities:* Case study analysis of real-world scenarios involving abortion decisions or small group discussions using ethical dilemma questions

Debate and Dialogue (fifth and sixth hours)

3. Facilitate respectful debate:

- Students research and represent different viewpoints
- Use structured formats like Socratic Seminar or Oxford-style debate
- *Possible Activities***:** Mock legislative hearing: students present arguments to a "committee" or reflection journals on how their views evolved

Policy Design Challenge (seventh and eighth hours)

4. Students work in teams to design a policy proposal:

- Consider legal, ethical, medical, and social factors
- Address access, parental consent, gestational limits, and education
- *Possible Activities:* Create a policy brief, an infographic, or present proposals to the class or to a panel of educators

Civic Engagement and Reflection (ninth and tenth hours)

5. Encourage real-world action:

- Explore how to contact representatives, attend town halls, or join advocacy groups
- Reflect on the role of youth in shaping public policy
- *Possible Activities:* Write a letter to a policymaker or create a public awareness campaign (poster, video, social media)

Teaching Policies

As your instructors:

- We will maintain neutrality and foster a safe space for all voices
- We will use anonymous surveys to gauge student comfort and understanding
- We will provide trigger warnings and opt-out options for sensitive content
- We will emphasize empathy, listening, and evidence-based reasoning

10.6 Case for the Classroom - Debate on Climate Change

B. Climate Change: Locating a Main Idea – A Mind Map for the Quest for Truth

Before we start working on this issue, I recommend you go to www.Procon.org to become familiar with the most current issues related to climate change. Once you have studied the academic considerations presented there, watch these videos:

Let's Watch: On Climate Change

Autumn Peltier on Water Advocacy

Video: "Autumn Peltier, 13-year-old water advocate, addresses UN" by CBC News [4:58] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Greta Thunberg and George Monbiot on the Climate Crisis

Video: "Greta Thunberg and George Monbiot make short film on the climate crisis" by Guardian News [3:41] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Corresponding Article for the above video: The Guardian – Greta Thunberg: 'We are ignoring natural climate solutions'

Our Reasoning-Building Tools for this challenge are what, for many years, we have called the 5W's + 1:

- Who?
- What?
- Where?
- When?
- Why?
- How?

Strategy Template

Download a version of this template in MS Word or Adobe PDF.

QUESTION	**DETAILS** supporting my responses to the questions	What do these details tell me about the validity of the Main Idea?
What is happening? • What does the author do/say? • What is the author expecting?		
Who is involved? • What names are mentioned? • What do I learn from the text about these names?		
Where does this take place? • In what country? • In what region? • Does it impact me? • In what manner?		
When does this event take place? • What dates are mentioned? • What events are mentioned?		
Why is this happening? • What are the reasons for the actions of the author or the actions mentioned by the author? • What reasons, actions, dates, and circumstances have been left out? • For what reason/purpose?		
How is this happening? • How can we agree or adopt a new perspective? • What are the reasons, actions, dates, and circumstances that we might want to include?		

Let's proceed with our mental mapping for this issue:

WHAT is climate change?

- Definition: A long-term shift in global or regional climate patterns, especially temperature and precipitation.
- Impacts:
  - Rising temperatures
  - More frequent and intense storms, droughts, and wildfires
  - Sea level rise
  - Health threats like heat stress, malnutrition, and disease spread

WHO is involved in climate change?

- Contributors: Primarily humans through activities like burning fossil fuels, deforestation, and industrial agriculture.
- Affected populations: Everyone, but especially vulnerable groups in developing countries, coastal regions, and areas with weak infrastructure.
- Decision-makers: Governments, corporations, scientists, activists, and international bodies like the UN and IPCC.
- Opposition voices: Some political figures and interest groups deny or downplay climate change, such as President Donald Trump, who recently called it a “scam”.

WHERE is climate change happening?

- Global reach: Climate change affects every continent and ocean.
- Current Hotspots:
  - Middle East: Facing extreme heat, droughts, and water scarcity.
  - Polar regions: Rapid ice melt and permafrost thaw.
  - Small island nations: Threatened by rising sea levels.
  - Urban centers: Vulnerable to heatwaves and flooding.
  - Salt marshes and ecosystems: Even research areas like Quebec’s marshes are becoming too hot for fieldwork.

WHEN did climate change start?

- Natural cycles: Climate has always changed over geological time.
- Human-driven acceleration: Began with the Industrial Revolution (around 1750), when fossil fuel use surged.
- Modern urgency: The last few decades have seen unprecedented warming rates and extreme weather events.

WHY is climate change happening?

- Main cause: Human activity—especially burning fossil fuels and changes in land-use.
- Greenhouse gases: CO_2, methane, and nitrous oxide trap heat in the atmosphere.
- Melting ice, deforestation, and permafrost thaw amplify warming.

HOW is climate change being addressed?

- Attempts at mitigation: Reducing emissions through renewable energy, reforestation, and sustainable practices.
- Adaptation: Building resilient infrastructure, improving disaster response, and modifying agricultural practices.
- Policy: International agreements (e.g., Paris Accord), national regulations, and local initiatives.
- Challenges:
    - Economic costs and political resistance
    - Misperceptions about public support for climate policies
    - Media silence in conflict zones like the Middle East

We are now ready to engage in a knowledgeable discussion about Climate Change.

Your closing task will be a written assessment of the current state of Climate Change and the potential solutions you are prepared to adopt to mitigate the consequences of the rapidly deteriorating global climate.

This can be either an individual writing prompt or a final paper on this task for groups of 5 students.

10.7 Chapter Summary

Let's Reflect

In this chapter, you were invited to see creativity as a disciplined partner to critical thinking in an AI-shaped world. Reflect on three anchors: first, the dynamic balance between divergent and convergent thinking—knowing when to generate many possibilities and when to narrow toward reasoned conclusions; second, the SCAMPER technique as a practical scaffold to remix, adapt, and reinvent ideas with intention; and third, the 5W+1H framework for extracting main ideas and evidence in complex civic or scientific issues and turning them into clear, ethical proposals.

As you look back, ask yourself: when did you switch modes productively, which SCAMPER prompts sparked real novelty, and how did the 5W+1H questions sharpen your judgment? Your goal isn't a single "right answer," but richer thinking that blends imagination with logic, curiosity with rigor, and originality with respectful dialogue.

Key Takeaways

- Creativity and critical thinking thrive by switching deliberately between divergent idea-generation and convergent evaluation—moving from “Right Answer” habits toward “Rich Thinking.”
- Divergent thinking invites brainstorming without judgment; convergent thinking applies logic, evidence, and criteria to refine ideas.
- Metacognition matters: notice when you’re generating vs. narrowing, and reflect on how each mode improves your results.
- A collaborative studio task uses mind mapping (environment, culture, technology, challenges) to practice open-ended ideation.
- The process emphasizes quantity first, quality later—share “what if…?” prompts, think aloud, and build on others’ ideas.
- Reflection (journaling or debrief) consolidates learning about your contributions, surprises, and growth in creative confidence.
- SCAMPER (Substitute, Combine, Adapt, Modify, Put to other uses, Eliminate, Reverse) offers a structured set of prompts to systematically remix and reinvent products, processes, or arguments.
- It operationalizes divergent thinking: each prompt pushes you to reframe constraints and surface non-obvious options.
- Used with mind maps, SCAMPER helps teams move from many possibilities to testable, improved solutions.
- Classroom modules (e.g., abortion legislation) model respectful, evidence-based dialogue, from background research to policy design and presentation.
- A 5W+1H analytical framework (Who, What, Where, When, Why, How) structures inquiry on topics like climate change, helping extract main ideas, evaluate evidence, and form reasoned proposals.
- Across cases, the goal is to pair human imagination with rigorous reasoning—skills that remain distinct from AI’s pattern recognition and are essential for ethical, civic decision-making.

Questions for Further Discussion

1. When working on a current assignment, where did you intentionally switch from generating ideas (divergent) to evaluating them (convergent)? What triggered the switch, and was it at the right time?
2. Which criteria do you use when you move into convergent mode (e.g., relevance, evidence, feasibility)? How could you make those criteria more explicit in your drafting or peer review?
3. Think of a time you got stuck aiming for a single "right answer." How would "rich thinking" have changed your process or outcome?
4. In a quick mind map for your next paper, what 3–5 unexpected branches could you add if you gave yourself permission to be "unrealistic" for five minutes? Which one is worth refining and why?
5. During group ideation, what behaviours (your own or others') most helped ideas multiply? What norms will you adopt next time to keep quantity high before judging quality?
6. After a brainstorming sprint, how will you document what you learned about your thinking (metacognitive notes, patterns, surprises) and translate that into concrete writing moves?
7. Choose one element of your current project (thesis, outline, evidence set, visual). Apply two SCAMPER prompts (e.g., Substitute, Reverse). What new versions did you produce, and which is most promising?
8. Which SCAMPER prompts feel most natural to you, and which feel uncomfortable? How might practicing the "uncomfortable" ones expose blind spots in your argument?
9. How could you combine SCAMPER with a quick rubric (3–4 criteria) to move from many options to one defensible choice for your draft?
10. Using 5W+1H, extract the main idea from a recent article on a complex topic (e.g., climate change or health policy). Which two "W/H" questions most altered your initial stance, and why?
11. In a class debate or discussion post, how will you show respectful, evidence-based dialogue when you encounter views you strongly disagree with? Draft two sentence frames you will actually use.
12. Design a mini-plan (policy brief, action step, or revised thesis) that blends a creative idea with logical constraints (evidence, stakeholders, feasibility). What trade-offs did you accept, and how will you justify them?

Activity: Creativity and Critical Thinking

Review the following questions about topics outlined in this chapter and choose the most appropriate answer.

Quiz Text Description (Questions)

1. MultiChoice Activity

What is the primary distinction between divergent and convergent thinking in this chapter?

a. Divergent critiques evidence; convergent imagines alternatives
b. Divergent is logical; convergent is illogical
c. Divergent is individual; convergent is always group-based
d. Divergent generates many possibilities; convergent evaluates and narrows them

2. MultiChoice Activity

Which classroom activity in the chapter is designed specifically to practice divergent thinking?

a. Evidence ranking using a rubric
b. Timed fact-checking of editorials
c. Silent reading and summarizing
d. "Invent a New World" mind-mapping studio

3. MultiChoice Activity

In brainstorming, which guideline best reflects the chapter's advice?

a. Stop as soon as you have three "good" ideas
b. Aim for quantity first; postpone judgment until later
c. Limit prompts to realistic scenarios only
d. Debate each idea immediately to keep quality high

4. MultiChoice Activity

What metacognitive move does the chapter encourage during writing and problem-solving?

a. Ignoring how you felt during group work
b. Noticing—and deliberately switching—between idea generation and evaluation
c. Selecting sources before selecting a topic
d. Writing conclusions before analyzing evidence

5. MultiChoice Activity

Which option correctly lists SCAMPER components emphasized in the chapter?

a. Substitute, Combine, Adapt, Modify, Put to other uses, Eliminate, Reverse

b. Scan, Capture, Arrange, Map, Evaluate, Review
c. Sort, Categorize, Annotate, Measure, Explain, Rehearse
d. Specify, Compare, Appraise, Model, Explain, Rebut

6. MultiChoice Activity

According to the chapter, what unique human capacity remains central even in the age of AI?

a. Error-free statistical inference
b. Imagination that produces original ideas and reframes problems
c. Automatic neutrality in debates
d. Perfect recall of large datasets

7. MultiChoice Activity

In the Applications section, which framework is recommended to analyze complex issues (e.g., climate change)?

a. 5W+1H (Who, What, Where, When, Why, How)
b. PESTLE (Political, Economic, Social, Tech, Legal, Environmental)
c. SWOT (Strengths, Weaknesses, Opportunities, Threats)
d. SMART (Specific, Measurable, Achievable, Relevant, Time-bound)

8. MultiChoice Activity

When preparing a policy brief or argument in class, what stance toward disagreement does the chapter promote?

a. Rely on personal anecdotes instead of cited sources
b. Use rhetorical tricks to "win" the debate
c. Practice respectful, evidence-based dialogue that acknowledges multiple perspectives
d. Silence opposing views to maintain classroom harmony

9. MultiChoice Activity

Which of the following best captures the chapter's shift from "Right Answer" to "Rich Thinking"?

a. Accepting any claim without evidence
b. Outsourcing decisions entirely to AI tools
c. Skipping research in favor of intuition
d. Valuing exploration, multiple options, and criteria-based selection before deciding

10. MultiChoice Activity

In the "Invent a New World" studio, which practice best implements SCAMPER during ideation?

a. Assessing feasibility before generating ideas
b. Using prompts like "Eliminate gravity" or "Reverse social roles" to evolve the world
c. Keeping technology constant to avoid complexity
d. Limiting the mind map to three branches only

Quiz Text Description (Answers)

1. d. Divergent generates many possibilities; convergent evaluates and narrows them
2. d. “Invent a New World” mind-mapping studio
3. b. Aim for quantity first; postpone judgment until later
4. b. Noticing—and deliberately switching—between idea generation and evaluation
5. a. Substitute, Combine, Adapt, Modify, Put to other uses, Eliminate, Reverse
6. b. Imagination that produces original ideas and reframes problems
7. a. 5W+1H (Who, What, Where, When, Why, How)
8. c. Practice respectful, evidence-based dialogue that acknowledges multiple perspectives
9. d. Valuing exploration, multiple options, and criteria-based selection before deciding
10. b. Using prompts like “Eliminate gravity” or “Reverse social roles” to evolve the world

Appendix: Additional Resources

- YouTube: The Sagan Series is an educational project working in the hopes of promoting scientific literacy in the general population.

OpenAI. (2025). ChatGPT. [Large language model]. https://chat.openai.com/chat
Prompts

AI was used for the following sections by scanning the author’s own work into ChatGPT. The results were reviewed, edited, and modified by the author:

- Key Takeaways Prompt: *“Create a chapter summary using a bulleted list for the attached file entitled “Chapter X.”*
- Questions for Further Discussion Prompt: *“Create a series of questions for reflection and classroom discussion for the attached file entitled “Chapter 10 – Creativity and Critical Thinking.”*

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Tusa'adah, L., & Djauhari, O. S. (2025). A sociolinguistic study of English abbreviations frequently used by Gen Z on TikTok. *Jurnal Bima: Pusat Publikasi Ilmu Pendidikan Bahasa dan Sastra, 3*(3), 183–189. https://doi.org/10.61132/bima.v3i3.2158 (Aripi Journal)

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Glossary

Ad Hominem

This fallacy attacks the person making an argument rather than addressing the argument itself.

Anecdotal Fallacy

The anecdotal fallacy is a fallacy that occurs when someone uses a personal experience or an isolated example to support a claim, rather than relying on more robust evidence. It is a type of informal fallacy where an individual relies on anecdotal evidence (stories, personal experiences, isolated examples) to draw a conclusion, even if that evidence is not representative or statistically significant.

Appeal to Authority

This fallacy relies on the opinion of a figure of authority, without considering actual evidence.

Appeal to Force

This fallacy attempts to win an argument by using threats or intimidation.

Appeal to Pity

This fallacy tries to win an argument by playing on emotions rather than using logic.

Artificial intelligence (AI)

Artificial intelligence (AI) refers to the capability of computational systems to perform tasks typically associated with human intelligence, such as learning, reasoning, problem-solving, perception, and decision-making. It is a field of research in computer science that develops and studies methods and software that enable machines to perceive their environment and use learning and intelligence to take actions that maximize their chances of achieving defined goals. Such machines may be called AIs.

Source: Text quoted from: *Artificial intelligence*, Wikipedia contributors, https://en.wikipedia.org/wiki/Artificial_intelligence, CC BY-SA 4.0. No changes.

Bandwagon Appeal

This fallacy suggests that something must be good or correct just because many people believe in it or do it.

Begging the Question

This fallacy assumes the very point that needs to be proven.

Categorical Syllogism

It is based on categories that follow the structure: “If A is part of C, then B is part of C”.

Circular Argument

A circular argument (also called *petitio principii*) occurs when the premise of an argument assumes the

truth of the conclusion, rather than providing evidence to support it. In essence, it's like trying to prove something by stating it as a fact in the first place.

Cognitive Offloading

Using external aids—like notes, calendars, calculators, or apps—to store information or perform mental steps so your brain doesn't have to, thereby reducing the load on working memory and attention (e.g., writing a to-do list, following GPS instead of memorizing directions).

Source: OpenAI. (2025). ChatGPT 5. [Large language model]. https://chat.openai.com/chat
Prompt: *Provide a brief definition of the term "cognative offloading" which can be used in a glossary for a book*

Conditional (Hypothetical) Syllogism

It is based on categories that follow the structure: "If A is true, then B is true" pattern.

Confirmation Bias

Confirmation bias is a type of implicit cognitive bias, a mental shortcut we unconsciously use that leads us to favour information that confirms our existing beliefs, assumptions, or hypotheses, while ignoring or undervaluing evidence that contradicts them.

Disjunctive Syllogism

It is based on categories that follow the structure: "Either A or B is true; if A is false, then B must be true" pattern.

Either/Or (False Dilemma)

This fallacy presents only two possible options when more exist.

False Analogy

This fallacy compares two things that aren't truly alike.

False Cause Fallacy

The false cause fallacy, also known as the fallacy of questionable cause, occurs when someone incorrectly assumes a causal relationship between two events or phenomena. This means they mistakenly believe that one event caused the other, simply because they are related or occur in a sequence, when there is no actual evidence to support that claim. Essentially, it's an error in reasoning where a correlation is mistaken for causation.

False Dilemma Fallacy

A false dilemma fallacy, also known as a false dichotomy or either-or fallacy, is a logical fallacy where only two options are presented as possibilities when more options exist. It oversimplifies a situation by suggesting there are only two choices, when in reality, there are other alternatives available.

Hasty Generalization

This fallacy occurs when someone makes a broad statement based on insufficient evidence. It often stems from limited data or a single experience.

Human Intelligence

Human intelligence is the intellectual capability of humans, which is marked by complex cognitive feats and high levels of motivation and self-awareness. Using their intelligence, humans are able to learn, form concepts, understand, and apply logic and reason. Human intelligence is also thought to encompass their capacities to recognize patterns, plan, innovate, solve problems, make decisions, retain information, and use language to communicate.

Source: Text quoted from: *Human intelligence*, Wikipedia contributors, https://en.wikipedia.org/wiki/Artificial_intelligence, CC BY-SA 4.0. No changes.

Metacognition

The awareness of and control over one's own thinking—specifically, the ability to monitor, evaluate, and adjust how you plan, understand, and learn.

Source: OpenAI. (2025). ChatGPT 5. [Large language model]. https://chat.openai.com/chat
Prompt: *Provide a brief definition of the word "metacognition" which can be used in a gloassary for a book*

Non Sequitur

From the Latin meaning "it does not follow", this fallacy occurs when a conclusion does not logically follow from the premises.

Particular Syllogism

Uses terms like "some" or "most" instead of absolutes. Used in legal reasoning.

Post Hoc (False Cause)

This fallacy assumes that just because one event occurred before another, the first event must have caused the second.

Red Herring

This fallacy distracts from the main issue by introducing an unrelated or tangential topic.

SCAMPER Method

A structured ideation tool that uses seven prompts—Substitute, Combine, Adapt, Modify (magnify/minify), Put to other uses, Eliminate, and Reverse/Rearrange—to interrogate and refine arguments, thesis statements, and drafts. Writers apply SCAMPER to generate alternative claims and evidence, reorganize structure, test assumptions, and improve clarity, coherence, and originality in their work.

Source: OpenAI. (2025). ChatGPT 5. [Large language model]. https://chat.openai.com/chat
Prompt: *Provide a definition for the Scamper method for generating ideas as it relates to critical thinking and writing*

Standards of Critical Thinking

The Standards of Critical Thinking are the tools that help a reader/writer to assess *clarity, accuracy, precision, relevance, depth, breadth, logic and fairness* in a text.

Straw Man

This fallacy misrepresents an opposing argument to make it easier to attack.

Syllogism

A syllogism is a form of deductive reasoning that consists of three parts: a major premise, a minor premise, and a conclusion. If the premises are true and logically structured, the conclusion must also be true.

Universal Syllogism

Uses absolute terms like “all” or “none”. Used for metaphysical debates.

Instructor Resources

Templates and Worksheets

- Download a copy of the prompt response writing Template in MS Word (45.9 KB) or PDF (75.5 KB).
- Download a copy of the Assumptions Worksheet Template from Chapter 4 in MS Word (45.8 KB) or PDF (65.5 KB).
- Download a copy of the Climate Change Strategy Template from Chapter 10 in MS Word (47.0 KB) or PDF (89.9 KB).

PowerPoint Slides

- Ch. 1 – Introduction to Critical Thinking (2.38 MB)
- Ch. 2 – Helping Students Assess Their Own Thinking (404 KB)
- Ch. 3 – The Standards of Critical Thinking (101 KB)
- Ch. 4 – Recognizing and Challenging Assumptions (90.6 KB)
- Ch. 5 – Evaluating Evidence in Academic Reading (87.5 KB)
- Ch. 6 – Artificial Reasoning Versus Human Reasoning (92.6 KB)
- Ch. 7 – The Era of Silent Erosion(88.3 KB)
- Ch. 8 – Analyzing and Developing Strong Arguments (78 KB)
- Ch. 9 – Critical Reading (82.1 KB)
- Ch. 10 – Creativity and Critical Thinking (92.8 KB)

Test Bank Questions

- Ch. 1: Introduction to Critical Thinking (MS Word; 48.0 KB) and (PDF; 92.2 KB)
- Ch. 2: Helping Students Assess Their Own Thinking (MS Word; 50.2 KB) and (PDF; 105 KB)
- Ch. 3: Standards of Critical Thinking (MS Word; 49.0 KB) and (PDF; 95.6 KB)
- Ch. 4: Recognizing and Challenging Assumptions (MS Word; 52.0 KB) and (PDF; 121 KB)
- Ch. 5: Evaluating Evidence in Academic Reading (MS Word; 54.4 KB) and (PDF; 136 KB)
- Ch. 6: Artificial Reasoning Vs. Human Reasoning (MS Word; 55 KB) and (PDF; 138 KB)
- Ch. 7: The Era of Silent Erosion (MS Word; 52.2 KB) and (PDF; 137 KB)
- Ch. 8: Analyzing and Developing Strong Arguments (MS Word; 51.0 KB) and (PDF; 95.6 KB)
- Ch. 9: Critical Reading (MS Word; 52.3 KB) and (PDF; 107 KB)
- Ch. 10: Creativity and Critical Thinking (MS Word; 51.8 KB) and (PDF; 107 KB)

Online Articles of Interest

Chow, A. R. (2025, June 23). *ChatGPT may be eroding critical thinking skills, according to a new MIT study*. *Time*. https://time.com/7295195/ai-chatgpt-google-learning-school/ (TIME)

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Video Resources

Videos

Video: “The Science of Thinking” by Veritasium [12:10] is licensed under the Standard YouTube License.*Transcript and closed captions available on YouTube.*

Version History

This page provides a record of edits and changes made to this book since its initial publication. Whenever edits or updates are made in the text, we provide a record and description of those changes here. If the change is minor, the version number increases by 0.1. If the edits involve a number of changes, the version number increases to the next full number.

The files posted alongside this book always reflect the most recent version.

Version	Date	Change	Affected Web Page
1.0	October 1, 2025	First publication	N/A