

Training students to become critical thinkers

Wageningen DEEM team + friends

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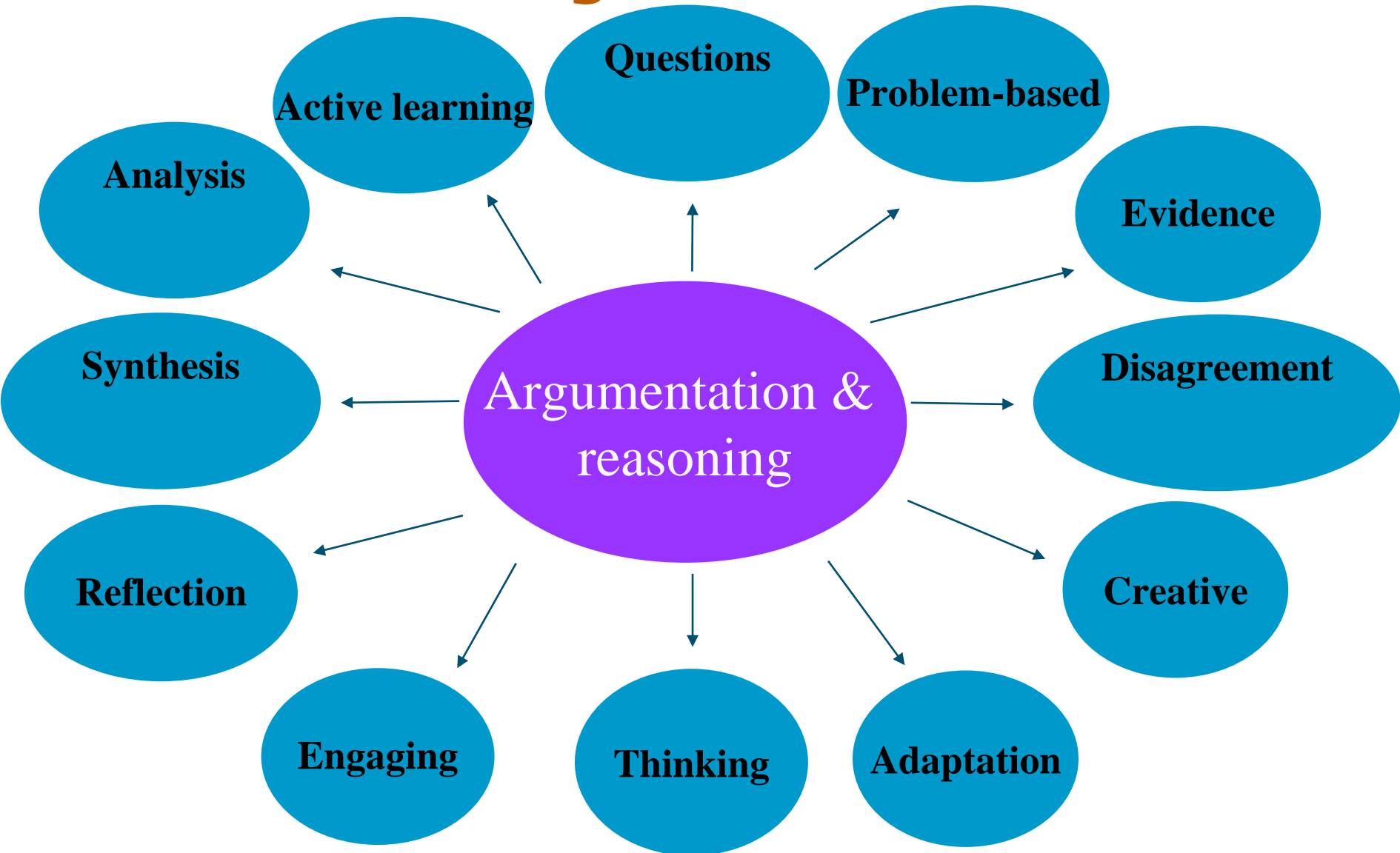
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Critical thinking

- What is critical thinking? Brainstorm
- Learning to learn
- Second-order learning
- Lifelong learning
- Making sure that you have good reasons for your beliefs
- <https://www.youtube.com/watch?v=HnJ1bqXUnIM>

Critical thinking

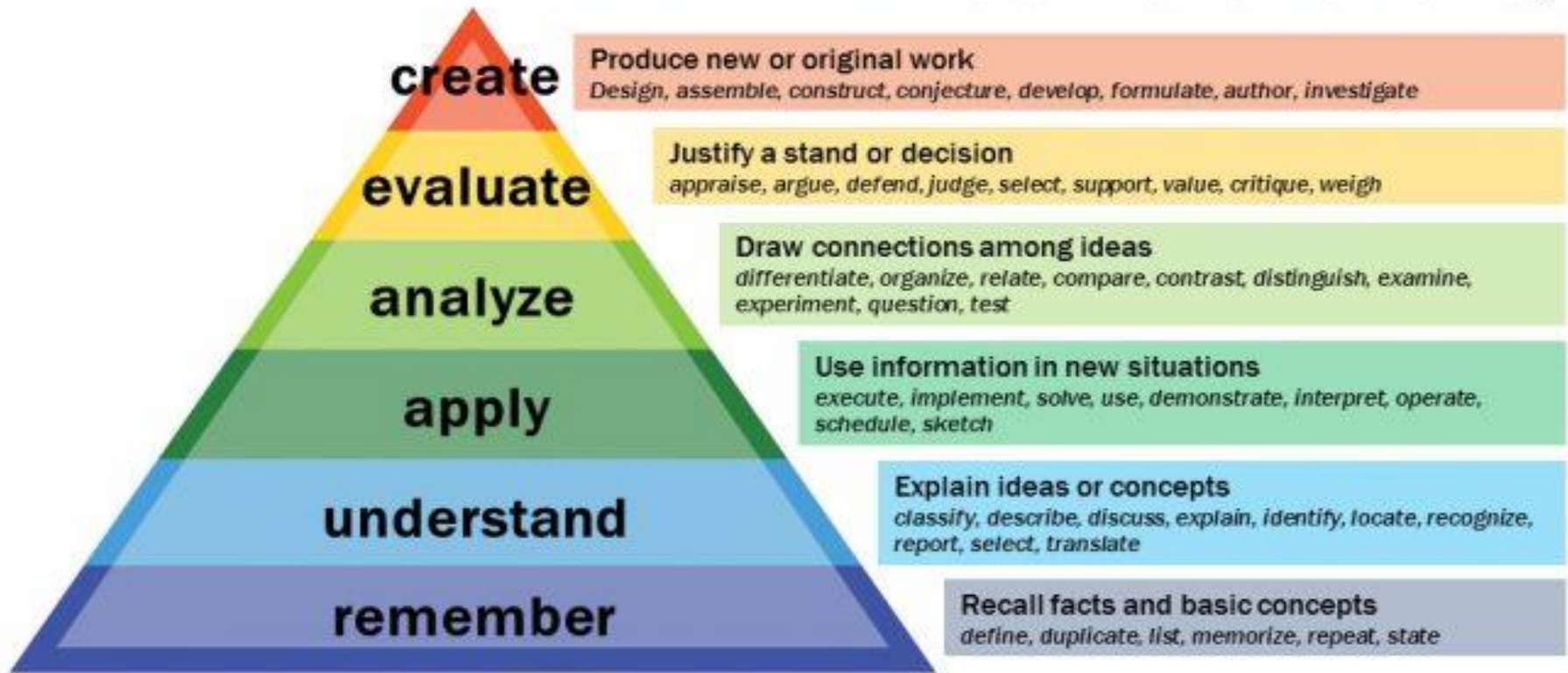


Characteristics of critical thinking

- Defining a problem or question
- Asking questions
- Examining evidence
- Analyzing assumptions and biases
- Avoiding emotional reasoning
- **Focus on reasoning**
- Avoiding oversimplification
- Considering other interpretations and view points
- Tolerating ambiguity
- Metacognition (how to process information)

Which level of Bloom's taxonomy is relevant to critical thinking?

Bloom's Taxonomy



Learning strategies

Traditional method

- Teacher-centered
- What to think
- Transmit knowledge
- Content

Critical learning method

- Student-centered
- How to think
- Facilitate knowledge
- Strategies, principles

Learning strategies

Traditional method

- Knowledge is additive
- Experiences and values are not fully considered
- Doubt and questioning weaken belief
- Broad, superficial
- Direct path to truth

Critical learning method

- Knowledge is holistic
- Experiences and values of the participants are essential and fully considered.
- Questioning is a sign of learning
- Focused, deep
- Indirect path to truth

Learning strategies

Traditional method

- Attention
- Recall
- Recitation/reading
- Single path to understanding
- Limited learning styles

Critical learning method

- Exploration
- Creativity
- Critical Analysis
- Indirect paths to understanding
- Multiple learning styles

Group discussion – foster critical thinking

- What learning methods do you use to foster critical thinking?
- What do you find challenging related to this learning methods?
- Write on a flipchart one learning method and related challenge
- Provide the sheet to your neighbouring group. They are asked to provide a solution to your challenge.

How to foster critical thinking

- Become a facilitator
- Seed discussions
- Encourage questions
- Encourage role-play
- Ask for justification and reasoning
- Focus on why and how
- Foster experimentation
- Foster collaboration and active engagement
- Provide feedback and encourage peer-feedback
- Let students explore, discover, engage, and debate

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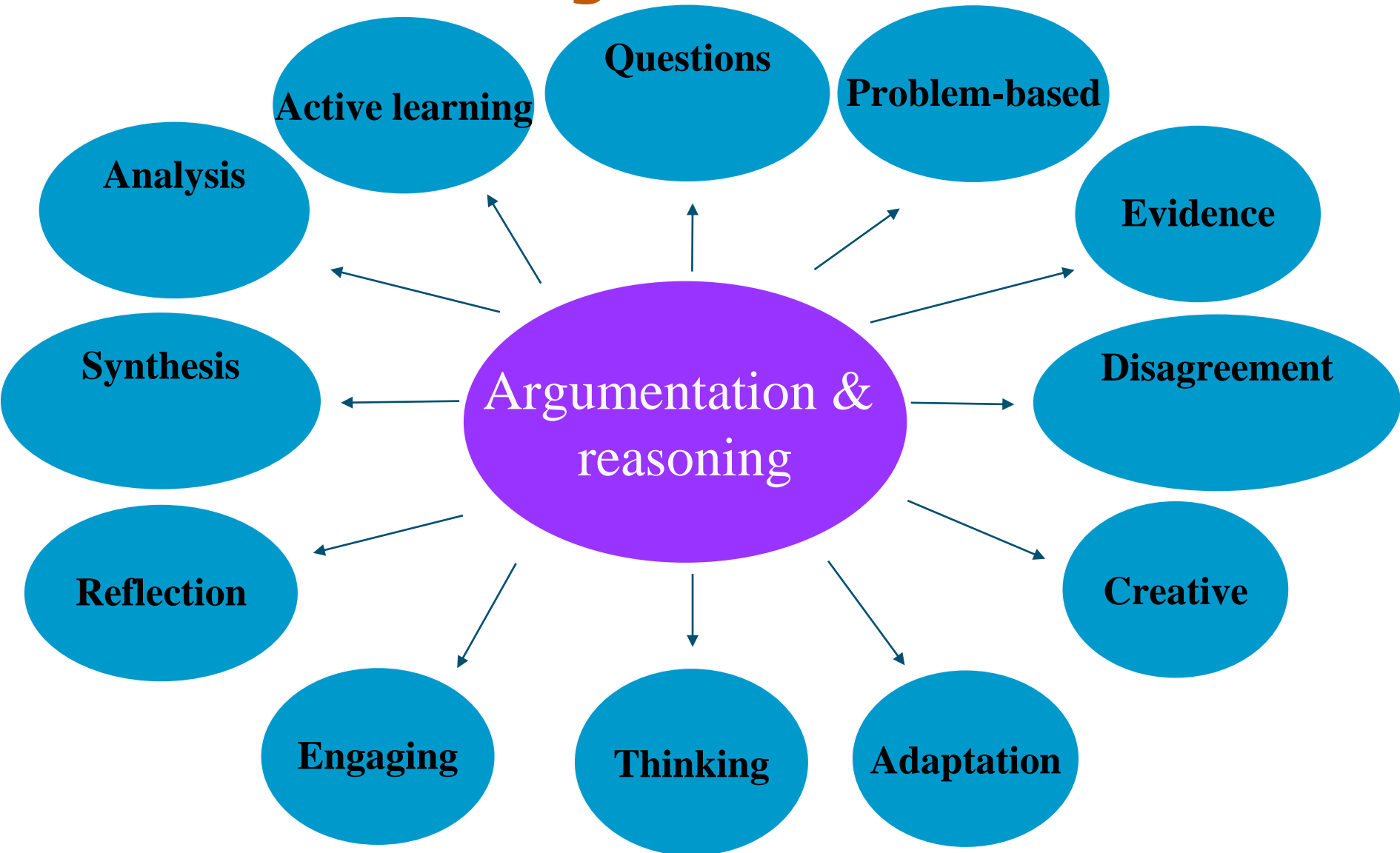
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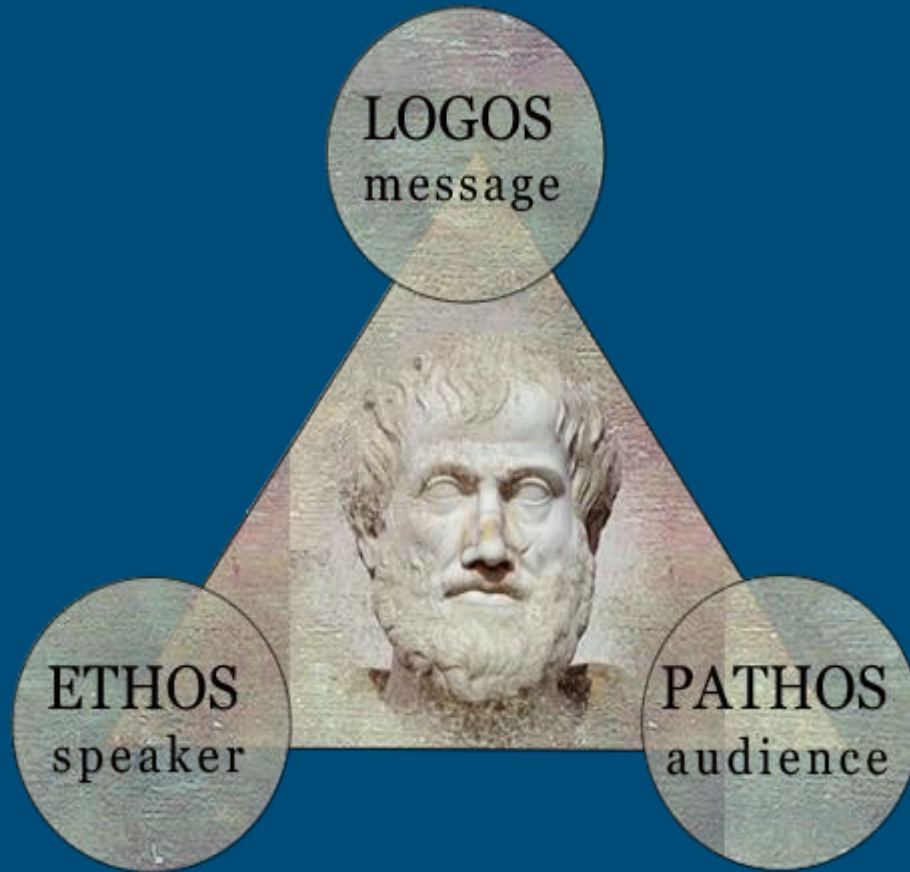
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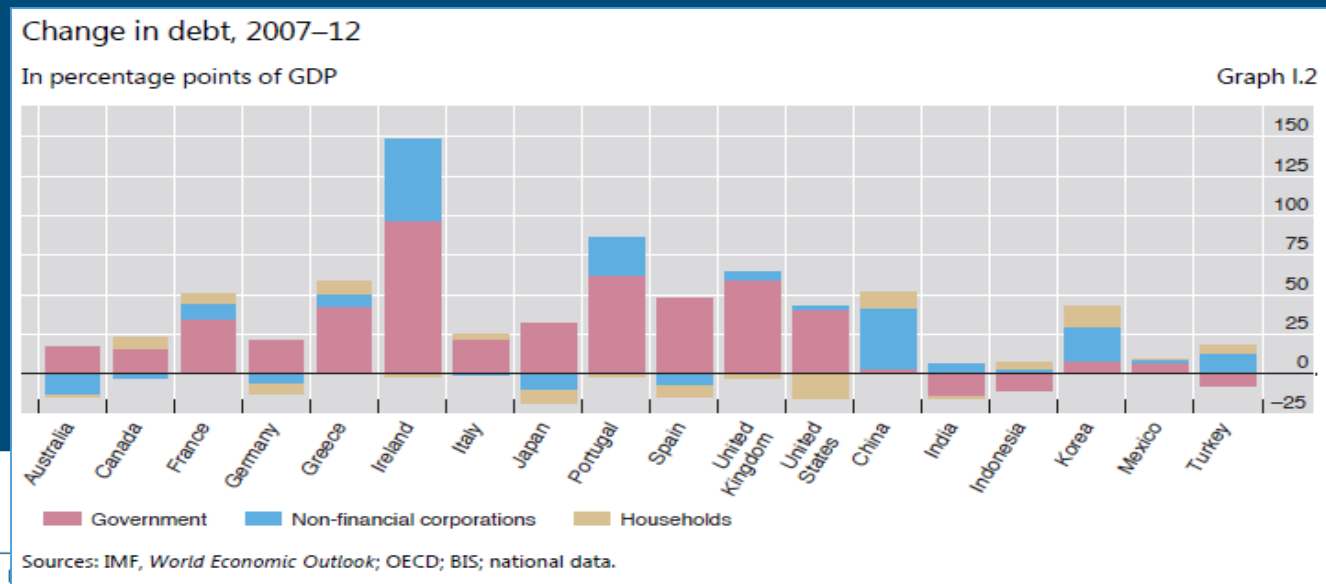


Fostering critical thinking, argumentation & reasoning



Logos

- Validity of speaker's argumentation (content).
- Effective presentation of the argument.
- Quality of the reasoning and evidence.
- Logos relies on logic and reason.



Types of reasoning

- Analogy: making a comparison between two similar cases and inferring that what is true in one case is true in the other

Road-pricing (pay-as you drive) worked well in Belgium, so in Holland it should also work.

- Cause-effect (causal relationship)= infers that a certain factor (a cause) is a force that produces something else (an effect)

My car is dangerous because the brakes are not working properly.

- Authority (rules or persons)

Buy Colgate because dentists advise it!

- Regularity (majority)

American presidents are unfaithful, Kennedy was a womanizer and so was Clinton.

Ethos

- Trustworthiness of the speaker.
- Character, credibility or reliability of writer.
- Use of credible, reliable sources & proper citation.
- Disclosing why you are interested in this topic.
- What are your personal experiences with the topic.
- Organizing your argument in a logical, easy to follow manner.



Pathos

- The speaker's ability to involve people emotionally.
- Emotional appeal of the argument/claim.
- Appeal to an audience's needs and values.
- Creating common ground with your audience.



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Forms of persuasion: Arts of Rhetoric by Aristotle

Logos

- Facts
- Numbers
- Figures
- Statistics
- Definitions
- Citations
- Examples

Ethos

- Titles
- Delivery
- Language
- Showing logos
- Fair minded
- Sincere
- Clothing

Pathos

- Emotional language
- Vivid descriptions
- Emotional examples
- Narratives
- Emotional voice
- Humour
- Expression

Persuasion means

■ Non-verbal behaviour

Non verbal Communication



■ Rhetorical figures

■ Metaphor

- *Life is a journey.*
- *The parks are the lungs of London.*

■ Alliteration

- *Happy, healthy, hopeful child*

■ Assonance

- *I must confess that in my quest I felt depressed and restless.*

■ Anaphora

- *It takes a family, it takes clergy, it takes business, it takes people, it takes all of us!*

Speeches

- <http://www.youtube.com/watch?v=rXzgMdj5urs>
George W. Bush 2001
- <http://www.youtube.com/watch?v=305aYAAOUFk>
Obama's inaugural address
- <http://www.youtube.com/watch?NR=1&feature=fvwp&v=TQmz6Rbpnu0&noredirect=1>

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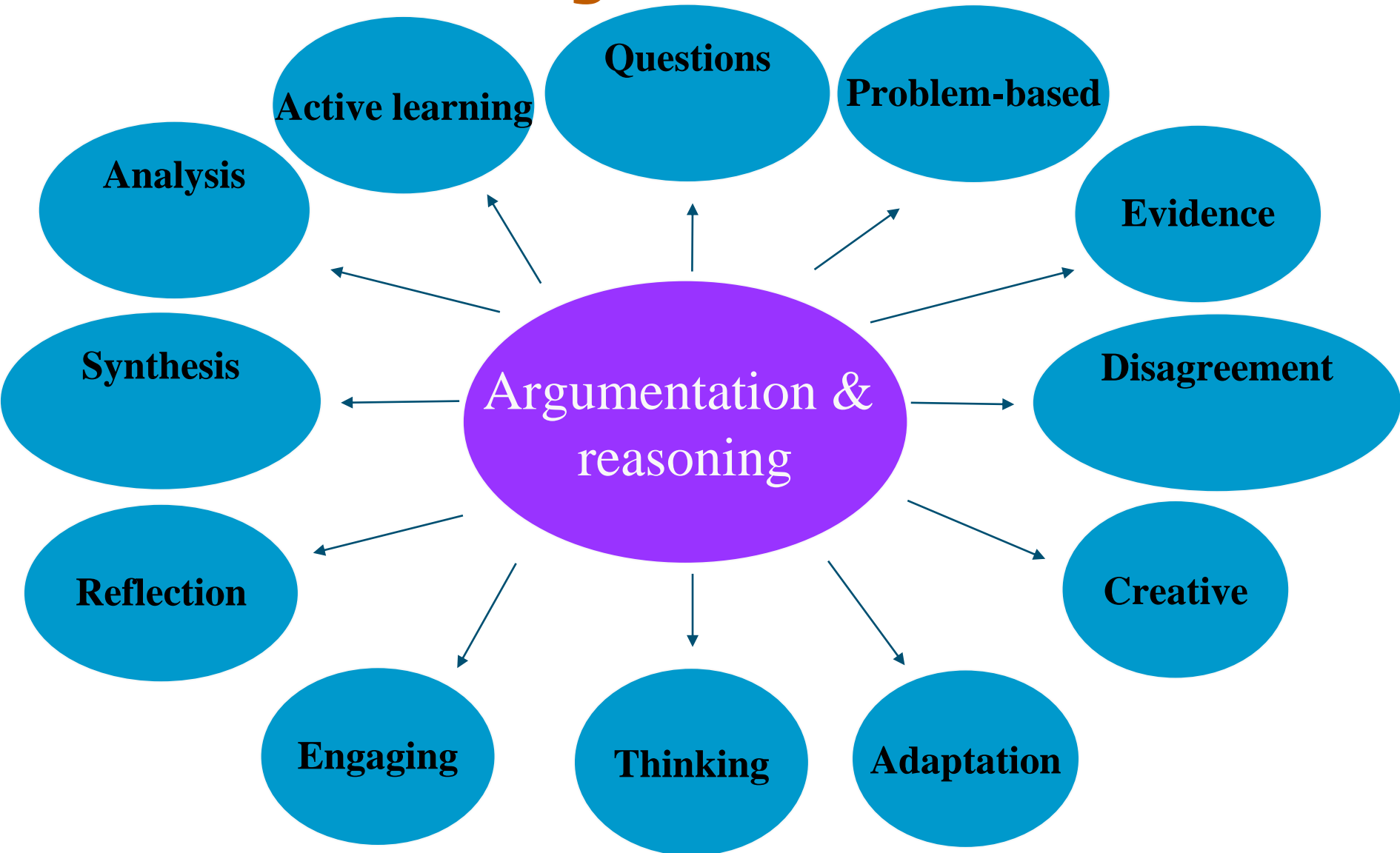
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Critical thinking



Critical thinking exercise

- Take one of the following topics.
 1. Electricity should be subsidised for the poor, even if tariffs increase for all.
 2. The benefits of dams outweigh the social and environmental implications.
 3. Foreign investors have too much power in the energy sector.
- Prepare a short plea of 5 minutes to convince your audience about your opinion.

Topics



- Electricity should be subsidised for the poor, even if tariffs increase for all



- The benefits of dams outweigh the social and environmental implications



- Foreign investors have too much power in the energy sector

Exercise

- Form groups of 3 people.
- You now have 5 minutes to convince your audience. Be serious about your statements.
- Give feedback to each other after each talk.
 - Was it convincing? Why?
 - What helped? What hindered?
 - What is needed for improvement?
- Swap roles.
- 3 rounds = 30 minutes

Keep cool if the audience disagrees with you

You are a professional! No matter how hard you try, not everyone in the world will agree with you!



Feedback form

Logos	Top:
Makes use of facts, statistics, authorities and shows thorough, relevant research.	Tip:
Ethos	Top:
The speaker shows trustworthiness, credibility, confidence.	Tip:
Pathos	Top:
The speaker involves audience and make a good connection with them.	Tip:
Delivery	Top:
Use of nonverbal behavior (voice, hand gestures, eye contact, body posture).	Tip:
Rhetorical figures	Top:
Use of different rhetorical figures such as metaphor, anaphora, assonance etc.	Tip:

Short reflection

- How did it go?
- Logos, Ethos, Pathos?
- Non verbal communication?
- Rhetorical figures?
- Any other observations?