



JURUSAN TEKNOLOGI INFORMASI

Critical Thinking & Problem Solving

01. Thinking and Reasoning

Tim Ajar Matakuliah CTPS

Critical Thinking and Problem Solving

- Description: In this course, students will learn about the concept of critical thinking and how to apply it in responding to information in everyday life. In addition, this course will teach concepts and techniques in solving cases/problems both within the scope of exams/tests, as well as on problems encountered in everyday life.
- 2 SKS / Credit → 4 hours/week

Course Contract

1. Intro to CTPS
2. Thinking and Reasoning
3. Critical thinking : the basics
4. Problem Solving: Basic Skill
5. Applied Critical Thinking part
6. Problem Solving: Advance Skill
7. Problem solving: further techniques
8. Critical reasoning: Advanced Level
9. Mid Test
10. Define / Problem identification
11. Define / problem indentification (work with team)
12. Ideation
13. Requirement Analysis
14. Further requirement analysis
15. Testing
16. Presentation
17. UAS

A series of lightbulbs are arranged in a horizontal line across the top of the slide. The background is dark grey. There are six unlit lightbulbs drawn in white chalk-like lines. Below them, a single lightbulb is lit, drawn in yellow with yellow rays emanating from it, signifying an idea or insight.

Why Critical thinking?

Background

- PISA (Programme for International Student Assessment) score of Indonesias's Student are bad
- PISA measures 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges.





- <https://www.youtube.com/watch?v=OmSCqRc8xf0>



<https://www.youtube.com/watch?v=-xsYoUXRDAc>

TOP 10 SKILLS OF 2025

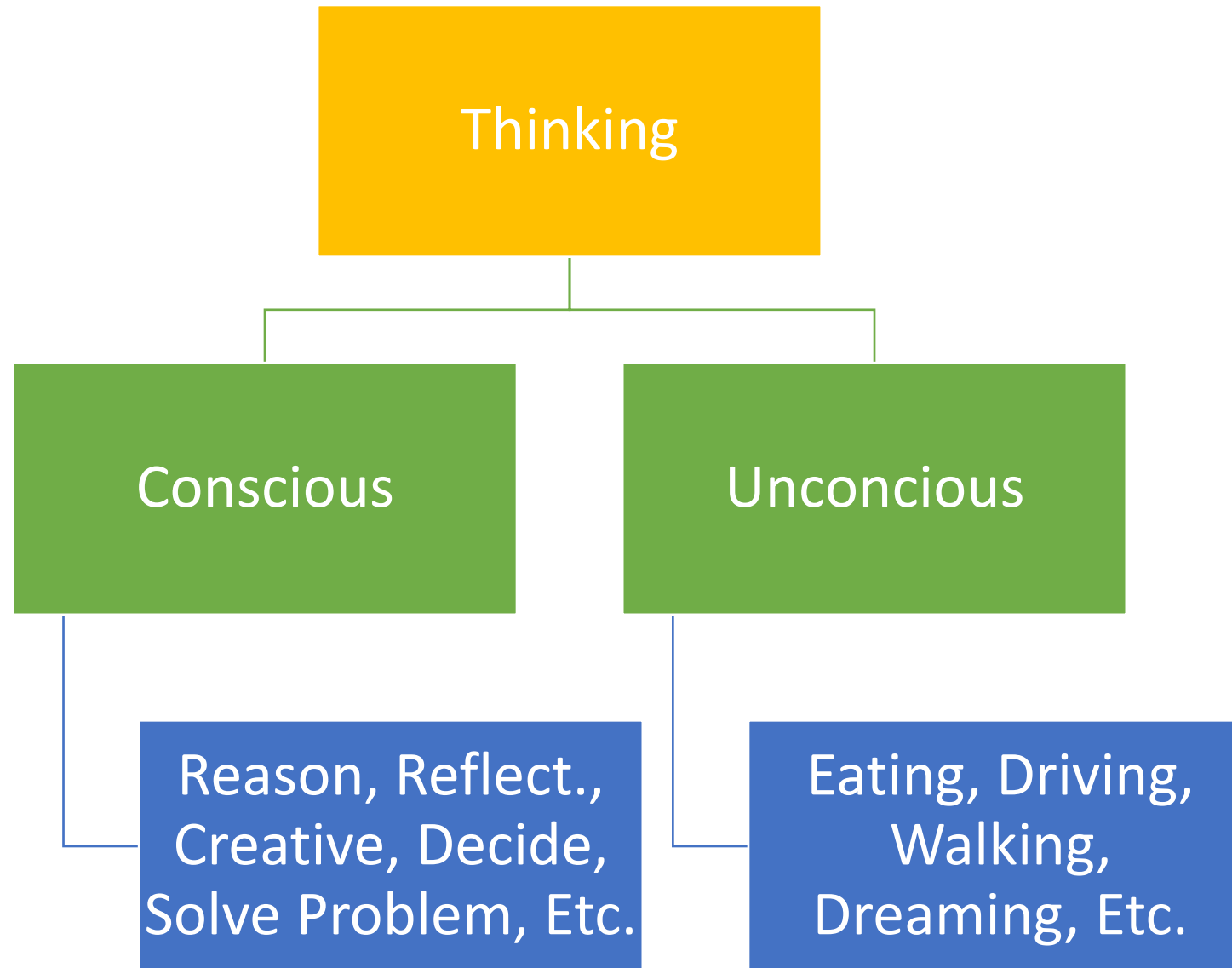


- 1  Analytical thinking and innovation
- 2  Active learning and learning strategies
- 3  Complex problem-solving
- 4  Critical thinking and analysis
- 5  Creativity, originality and initiative
- 6  Leadership and social influence
- 7  Technology use, monitoring and control
- 8  Technology design and programming
- 9  Resilience, stress tolerance and flexibility
- 10  Reasoning, problem-solving and ideation

Chapter 1

Thinking as a Skill





Reasoning

Reasoning is the process by which we **advance from what we know already to new knowledge and understanding**. Being **rational is recognising that from some facts or beliefs others follow, and using that understanding to make decisions or form judgements with confidence**. If there is one overriding aim of this course it is to improve students' confidence in reasoning.

Penalaran

Penalaran adalah proses yang dengannya kita maju dari apa yang sudah kita ketahui menjadi pengetahuan dan pemahaman baru.

Menjadi rasional adalah mengakui bahwa dari beberapa fakta atau keyakinan yang diikuti orang lain, dan menggunakan pemahaman itu untuk membuat keputusan atau membentuk penilaian dengan percaya diri. Salah satu tujuan utama dari matakuliah ini adalah untuk meningkatkan kepercayaan diri siswa dalam penalaran.



Creative Thinking

The reasoning is not the only higher thinking skill, nor the only kind of rationality. Imaginative and creative activities are no less important in the history of human development and achievement. Clearly, there are times when a seemingly insoluble problem has been cracked by an imaginative leap rather than a methodical process. Some of the greatest advances in science have been the result of creative thinking that appeared to conflict with reason when first put forward.



Berpikir Kreatif

Penalaran bukan satu-satunya keterampilan berpikir yang lebih tinggi, atau satu-satunya jenis rasionalitas. Kegiatan imajinatif dan kreatif tidak kalah penting dalam sejarah pembangunan dan prestasi manusia. Jelas, ada kalanya masalah yang tampaknya tidak terpecahkan telah dipecahkan oleh lompatan imajinatif daripada proses metodis. Beberapa kemajuan terbesar dalam sains adalah hasil dari pemikiran kreatif yang tampaknya bertentangan dengan alasan ketika pertama kali diajukan.

Reflection

Another quality that is evidently exclusive to human thinking is reflection. Reflecting means giving **deep or serious or concentrated** thought to something, beyond the immediate response to stimuli. When we are engaged in reflection we don't just make up our minds on impulse, but carefully consider alternatives, think about consequences, weigh up available evidence, draw conclusions, test hypotheses and so on. Critical thinking, problem solving and decision making are all forms of reflective thinking.

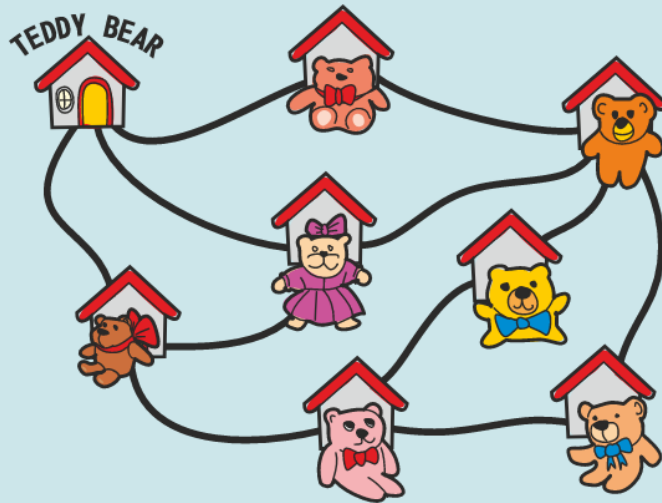
Refleksi

Kualitas lain yang jelas eksklusif untuk pemikiran manusia adalah refleksi. Refleksi berarti memberikan pemikiran yang mendalam atau serius atau terkonsentrasi pada sesuatu, di luar respons langsung terhadap rangsangan. Ketika kita terlibat dalam refleksi kita tidak hanya membuat pikiran kita pada dorongan hati-hati mempertimbangkan alternatif, berpikir tentang konsekuensi, menimbang bukti yang tersedia, menarik kesimpulan, menguji hipotesis dan sebagainya. Berpikir kritis, pemecahan masalah dan pengambilan keputusan adalah semua bentuk pemikiran reflektif.



2020-IS-02 Teddy Bear hunt

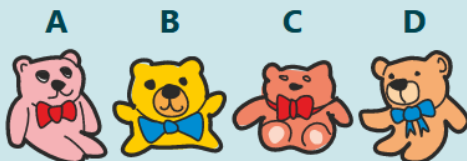
The beaver family goes for a Teddy Bear hunt. They start from their home (named TEDDY BEAR) walking only along the roads and return back to their home. Along the way, they take pictures of the Teddy Bears they see. Below is a map of their village.



They saw 4 Teddy Bears and below are the pictures they took, but they forgot one!



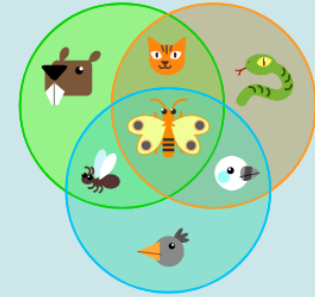
Which Teddy Bear did they forget?





2020-US-03-000 Zoo Animals

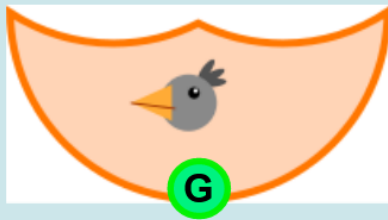
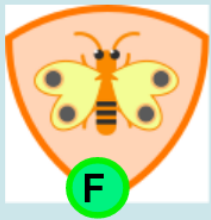
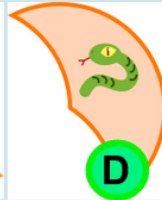
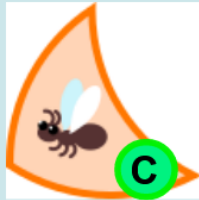
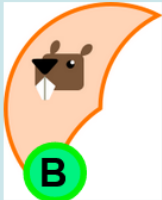
The following diagram shows three circles. Each circle shows different animals. One circle shows animals with stripes, one circle shows animals with more than two legs, and one circle shows animals with wings. If an animal has wings and stripes then it will be placed in the overlap of both circles.



Your friend has selected two types of animals that she likes. She tells you:

- I like winged animals that don't have stripes or many legs.
- I also like animals without wings and that have stripes and many legs.

Question / Challenge: Choose two animals that your friend likes.



- 'Critical', 'criticism' and 'critic' all originate from the ancient Greek word kritikos, meaning able to judge, discern or decide. In modern English, a 'critic' is someone whose job it is to make evaluative judgements, for example about films, books, music or food. Being 'critical' in this sense does not merely mean finding fault or expressing dislike, although that is another meaning of the word. It means giving a fair and unbiased opinion of something.
- A critical thinking must have some basis, which usually requires a measure of knowledge or expertise on the part of the person making the judgement.

- 'Kritis', dan 'kritik' semuanya berasal dari kata Yunani kuno kritikos, yang berarti mampu menilai, membedakan, atau memutuskan. Dalam bahasa Inggris modern, 'kritikus' adalah seseorang yang tugasnya membuat penilaian evaluatif, misalnya tentang film, buku, musik atau makanan. Menjadi 'kritis' dalam pengertian ini tidak hanya berarti mencari kesalahan atau mengungkapkan ketidaksukaan, meskipun itu adalah arti lain dari kata tersebut. Artinya memberikan pendapat yang adil dan tidak memihak terhadap sesuatu.
- Sebuah pemikiran kritis harus memiliki beberapa dasar, yang biasanya membutuhkan ukuran pengetahuan atau keahlian dari orang yang membuat penilaian.

Activities in CT

Analysis

- identifying the key parts of a text (can be written/images/videos/sounds) and reconstructing it in a way that fully and fairly captures its meaning. This is particularly relevant to arguments, especially complex ones.

Evaluation

- judging how successful a text is: for example, how well an argument supports its conclusion; or how strong some piece of evidence is for a claim it is supposed to support.

further argument.

- own response to the text in question, by presenting a reasoned case for or against the claims it makes.

Aktifitas dalam CT

Analysis

- mengidentifikasi bagian-bagian kunci dari sebuah teks(bisa berupa tulisan/gambar/video/suara) dan merekonstruksinya dengan cara yang sepenuhnya dan wajar menangkap maknanya. Ini sangat relevan dengan argumen, terutama yang kompleks.

Evaluation

- menilai seberapa sukses sebuah teks: misalnya, seberapa baik argumen mendukung kesimpulannya; atau seberapa kuat beberapa bukti untuk klaim yang seharusnya didukungnya.

further argument.

- memberikan tanggapannya sendiri terhadap teks yang dipertanyakan, dengan menyajikan alasan yang mendukung atau menentang klaim yang dibuatnya.

CT Characteristic

fair and open-minded

- . Without an open mind we cannot judge fairly and objectively whether some statement or story is true or not.

active and informed

- We have to be ready to take an active interest in the subject matter, and be prepared to investigate and enquire. Hasty, uninformed judgements are never critical. At the very least we would need to read the article before an informed judgement is possible.

Sceptical

- Some degree of scepticism is also needed: a willingness to question or to entertain doubt.

independent.

- critical thinking requires independence. It is fine to listen to others, to respect their beliefs and opinions, to learn from teachers, to get information from books and/or from online sources. But in order to think critically you must also be prepared to take some initiative: to ask your own questions and reach your own conclusions.

Karakteristik CT

Adil dan berpikiran terbuka

- Tanpa pikiran terbuka kita tidak bisa menilai secara adil dan obyektif apakah pernyataan atau cerita itu benar atau tidak.

aktif dan terinformasi

- Kita harus siap untuk mengambil minat aktif dalam materi pelajaran, dan bersiap untuk menyelidiki dan bertanya. Penilaian yang tergesa-gesa dan kurang informasi tidak pernah kritis. Paling tidak kita perlu membaca artikel sebelum penilaian yang tepat dimungkinkan.

Skeptis

- Beberapa tingkat skeptisisme juga diperlukan: kesediaan untuk mempertanyakan atau meragukan.

merdeka

- Berpikir kritis membutuhkan independensi. Tidak apa-apa untuk mendengarkan orang lain, untuk menghormati keyakinan dan pendapat mereka, untuk belajar dari guru, untuk mendapatkan informasi dari buku dan / atau dari sumber online. Tetapi untuk berpikir kritis, Anda juga harus siap untuk mengambil beberapa inisiatif: untuk mengajukan pertanyaan Anda sendiri dan mencapai kesimpulan Anda sendiri.

The background of the slide shows a pair of hands held palm up, with several white question marks floating above them. White arrows point from the hands towards the question marks, suggesting a process of questioning or seeking answers. The entire scene is overlaid with a semi-transparent dark grey filter.

Thank you!

Any Question?