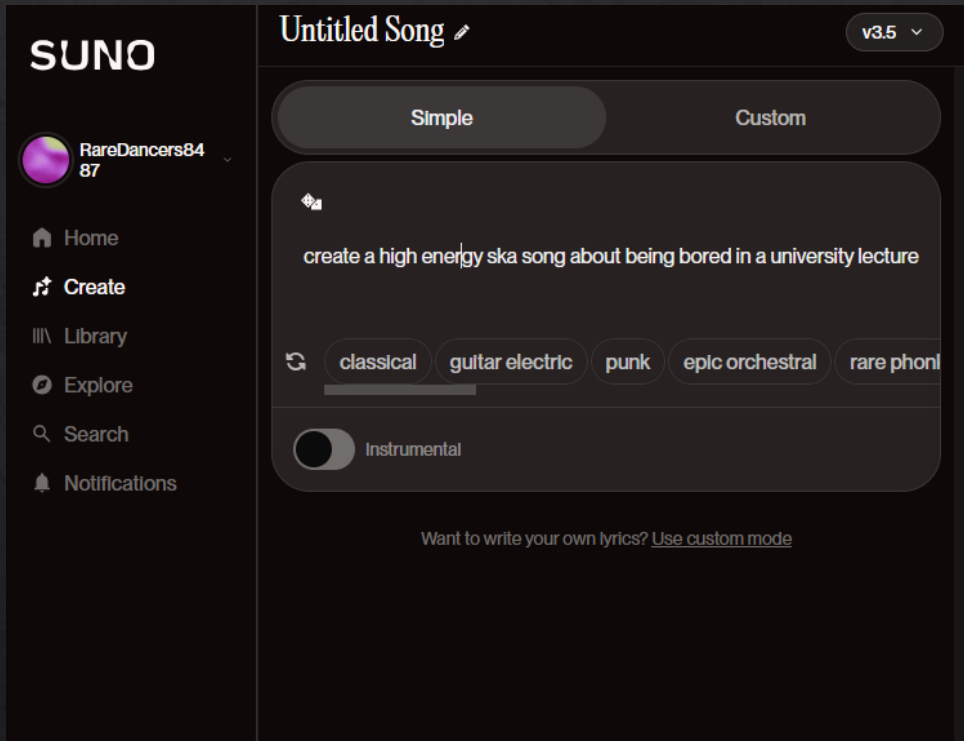


Let's make some music!



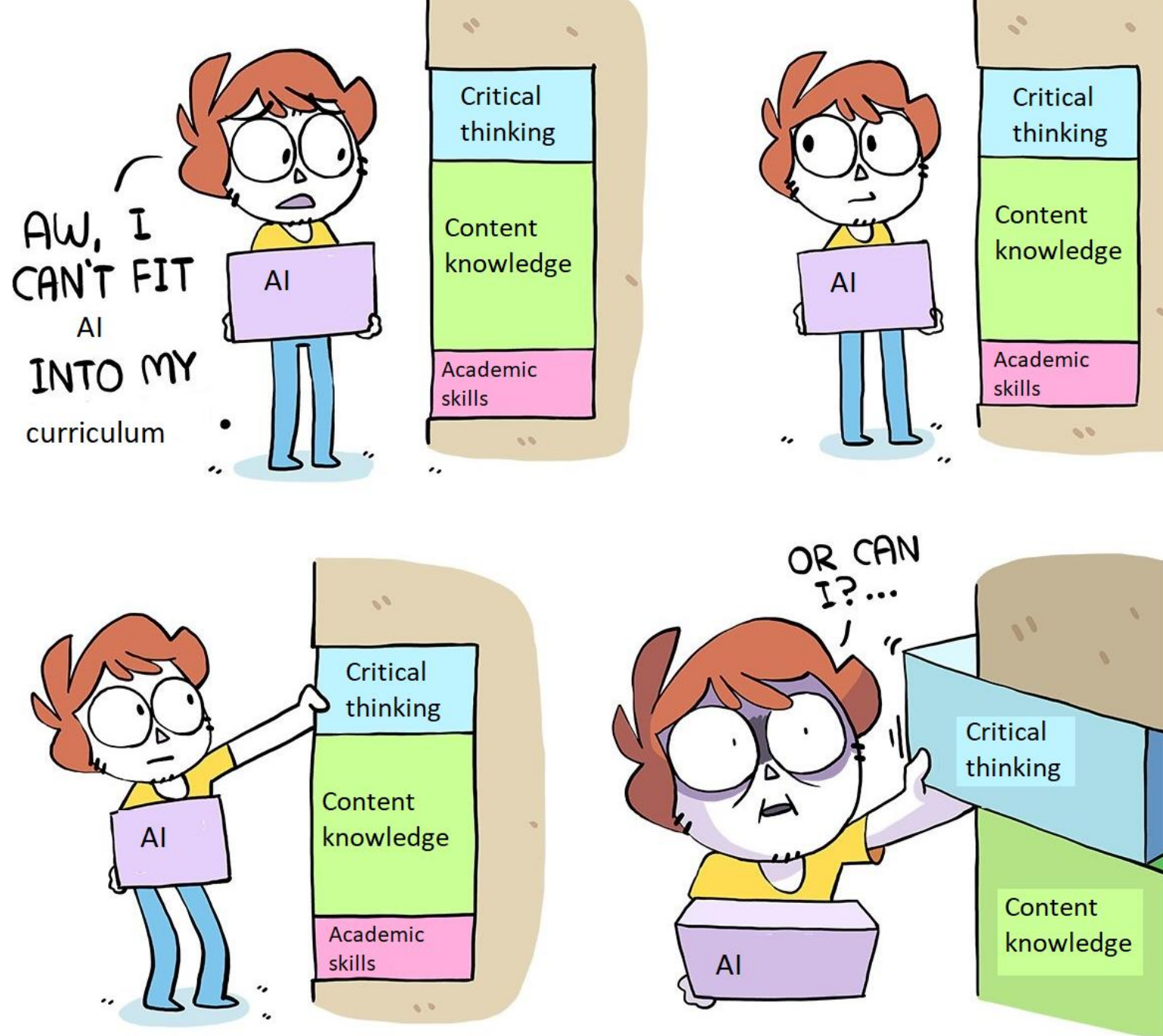
<https://suno.com/>

Create a song in your favourite genre about the most recent experience you had

What did you just make? Is it art? Content? Pure noise?

Challenges and opportunities in the current state of play with AI in education

Dr Luke Zaphir



Today's talk

An overview of AI

The current landscape of AI

Questions to consider in the classroom

Use cases

A chess-playing AI

- ◆ Imagine a computer engineering student says they've created the ultimate chess AI opponent
- ◆ They claim that no human can beat it
- ◆ It works by playing every single move after the human moves, and picking only the possible worlds where it wins
- ◆ Is the AI reasoning?

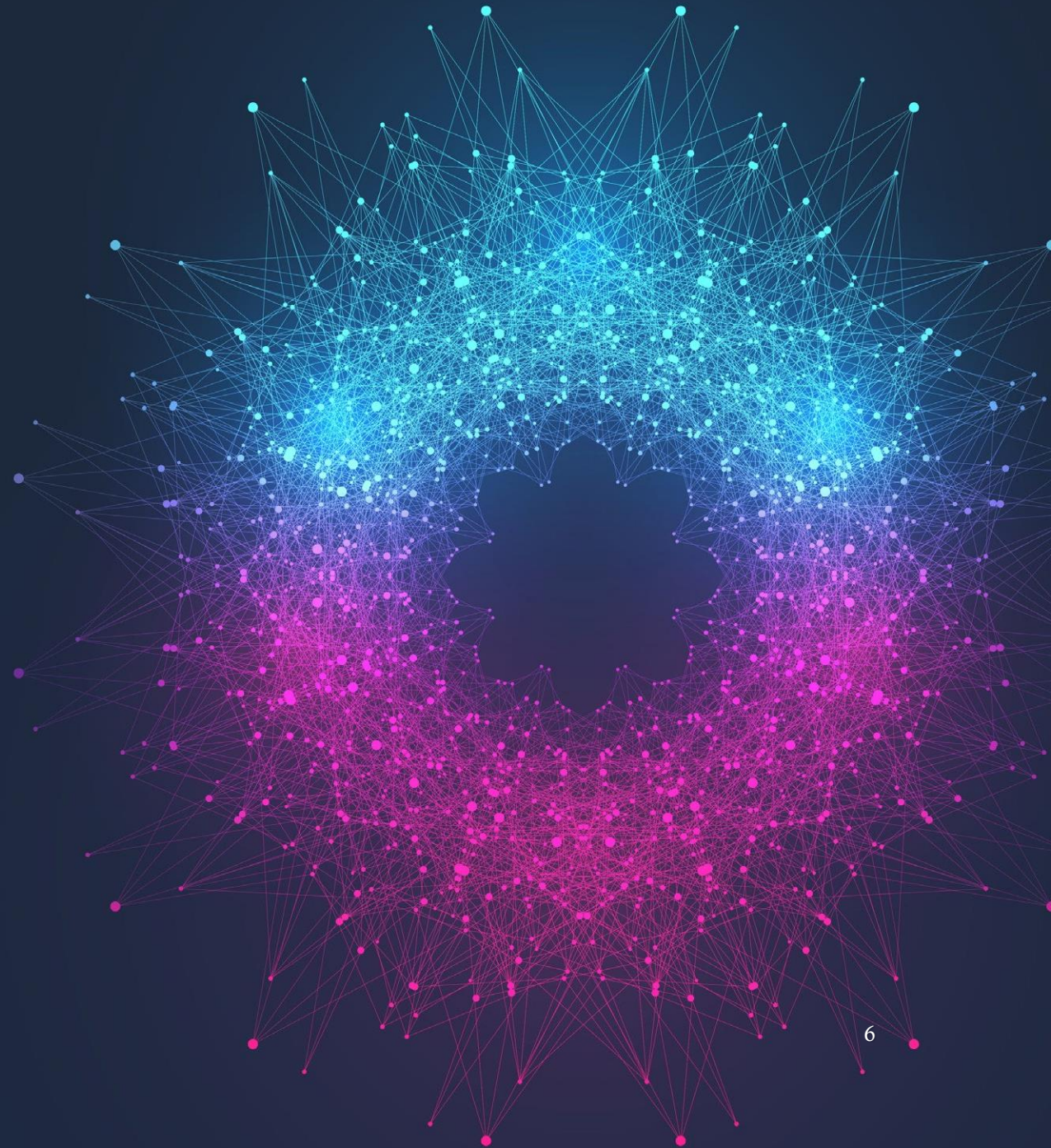


WHAT IS ARTIFICIAL INTELLIGENCE?

- ◇ Systems able to perform tasks that typically require human intelligence.
- ◇ e.g.
 - Recognize faces (face recognition)
 - Drive a car (self-driving AI)
 - Recommend movies (Netflix algorithm)
 - Diagnose diseases (medical AI systems)
 - Translate languages (Google Translate)

GENERATIVE ARTIFICIAL INTELLIGENCE

- ◈ A subset of AI which creates something from existing data.
- ◈ e.g.
 - Text
 - Images
 - Videos
 - Code



ACTIVITY: USE
PREDICTIVE TEXT ON
YOUR DEVICE TO
FINISH THIS SENTENCE

“I can’t make it to work
today because I _____”

How Large Language Models work

ChatGPT, Google Gemini, DeepSeek etc

Trained on massive text data (Books, websites, conversations — billions of words)

Learns patterns between words (Not facts — just what words tend to go together)

Uses a neural network (A complex system that mimics how we connect ideas)

Breaks text into tokens (Small pieces like words or parts of words)

Predicts the next word (One token at a time — based on what came before)

Keeps going until it makes a full response (That's how it writes paragraphs, stories, or answers)

LEARNING FROM HUMAN FEEDBACK

E You

How long would it take to burn 1 kilo of fat

Which response do you prefer?

Your choice will help make ChatGPT better.



Response 1

The rate at which the human body burns fat depends on various factors, including metabolic rate, activity level, and overall health. On average, it's often stated that a calorie deficit of 3,500 calories results in the loss of approximately one pound (about 0.45 kilograms) of body fat. This estimate is based on the assumption that one pound of body fat is roughly equivalent to 3,500 calories.

If we apply this estimate to burning 1 kilogram (approximately 2.2 pounds) of fat, it would theoretically require a calorie deficit of around 7,700 calories ($3,500 \text{ calories/pound} \times 2.2 \text{ pounds/kilogram}$). However, it's important to note that individual variations exist, and factors like metabolic rate, age, gender, and body composition can affect how quickly someone loses weight.

In practice, creating a calorie deficit can be achieved through a combination of dietary changes (reducing calorie intake) and increased physical activity (to burn more calories). It's generally recommended to aim for a gradual and sustainable rate of



Response 2

The time it takes to burn 1 kilogram of body fat can vary significantly from person to person due to several factors such as metabolism, activity level, diet, and individual physiology. However, there's a general rule of thumb that suggests burning roughly 7,000 to 7,700 calories can result in losing about 1 kilogram of body fat.

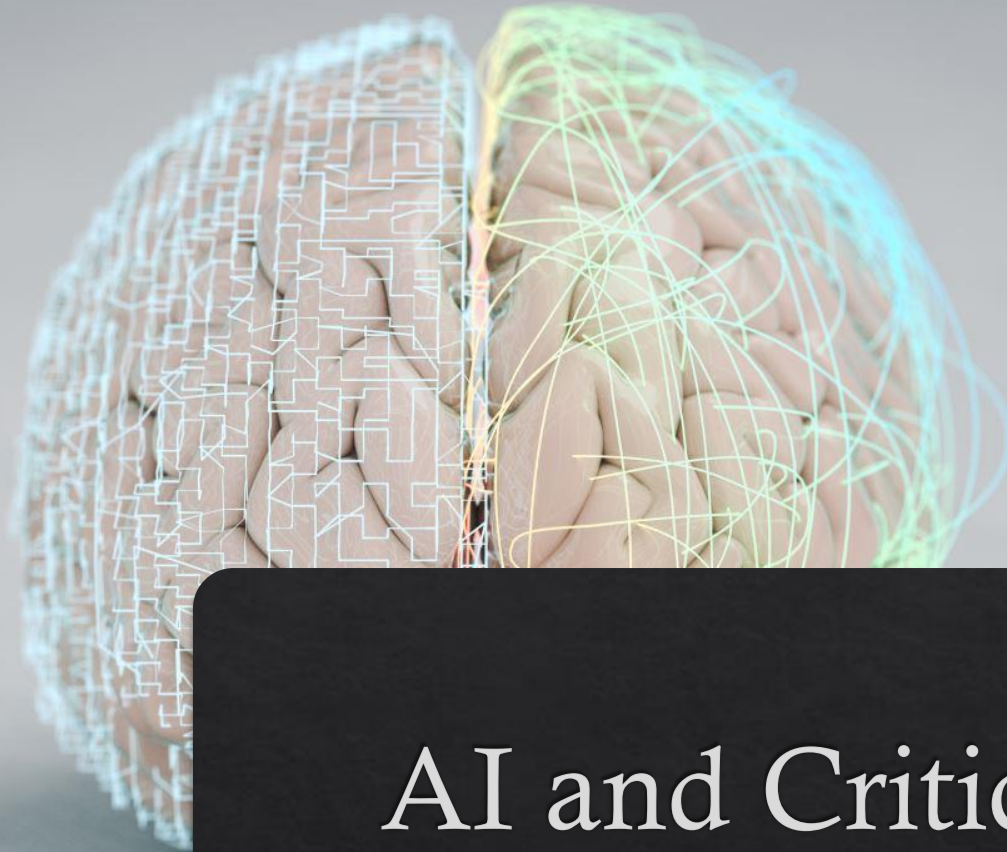
Now, calculating the time it takes to burn that amount of calories depends on how many calories you can burn per day through activities, exercise, and your basal metabolic rate (the calories your body burns at rest).

For example, if you create a calorie deficit of 500 calories per day through a combination of diet and exercise, it might take around 14-15 days to burn 1 kilogram of fat (assuming 1 kilogram of fat is roughly 7,000 calories). However, this is a very rough estimate and individual results can vary.

It's important to approach weight loss with a sustainable and healthy mindset rather than focusing solely on the speed of

Message ChatGPT...





AI and Critical Thinking

Using AI deliberately

- ◆ Kim has a large workload this semester. She's required to read a chapter of a text book and an article for each of her courses. She decides to upload them into ChatGPT to summarise the main points and make them easily consumable.
- ◆ Her reading load drops from 40-50 pages a week to 4-5 paragraphs. Kim can more confidently contribute to tutorials and answer quiz questions with less stress.
- ◆ *What are the possible advantages and disadvantages of this approach?*



Cognitive offloading

Refers to the externalisation of cognitive processes by using tools or people to free up cognitive resources

Creates greater mental efficiency and reduced mental strain (i.e. cognitive offloading makes things easier and faster)

Excellent uses of cognitive offloading include filtering irrelevant information (like the filter function on a search engine), setting reminders and writing to-do lists, delegating tasks in group work, brainstorming on sticky notes

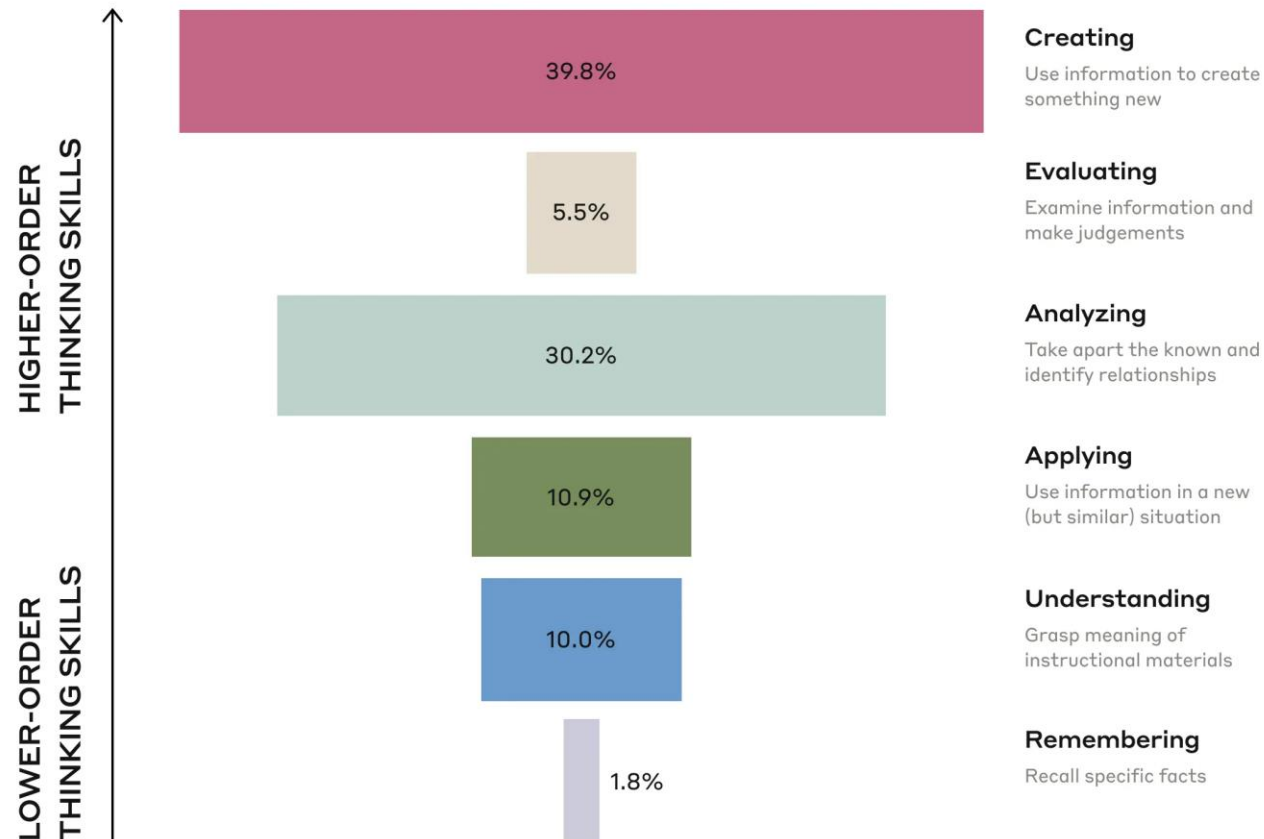
Hazardous uses include note-taking without processing, relying on algorithms to make recommendations for viewing, doomscrolling on social media to emotionally cope, asking google or AI for problem solving

Higher AI usage can lead to greater cognitive offloading and a decrease in critical thinking



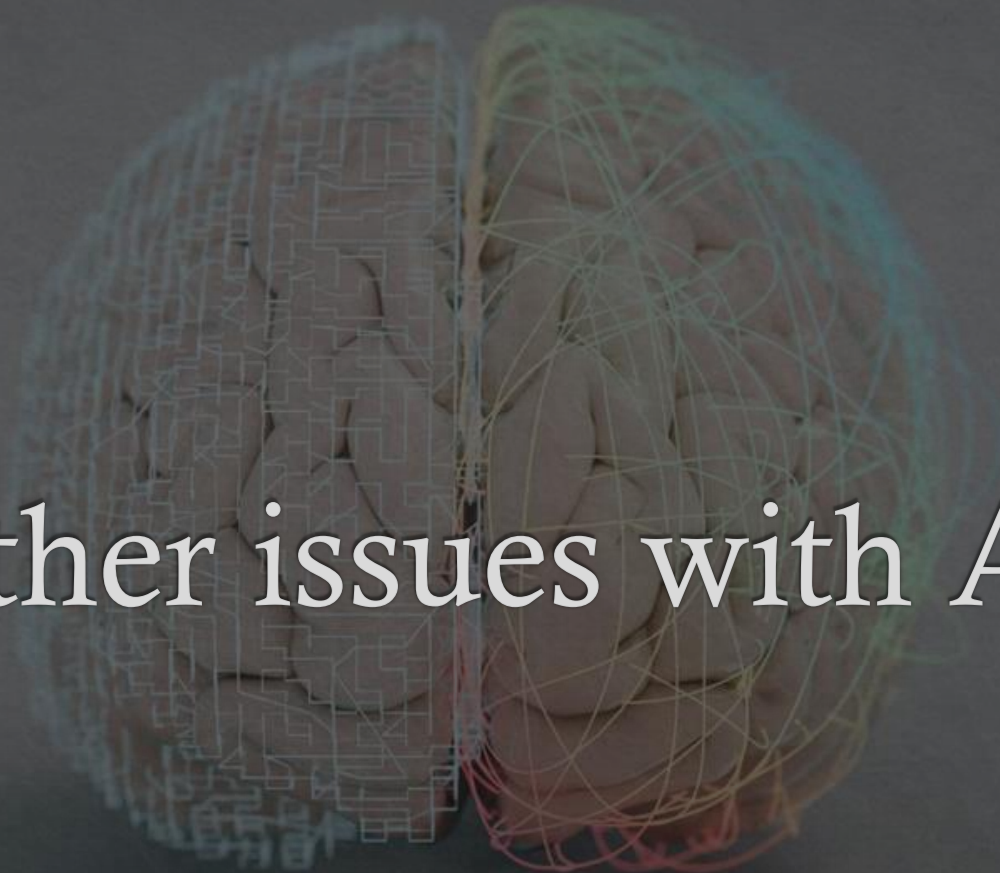
Calculators allow the user to cognitively offload some of the mathematical process so that they can do more complex tasks

Claude's skills on Bloom's Taxonomy



AI creates efficiency and ease which are *not goals of education*

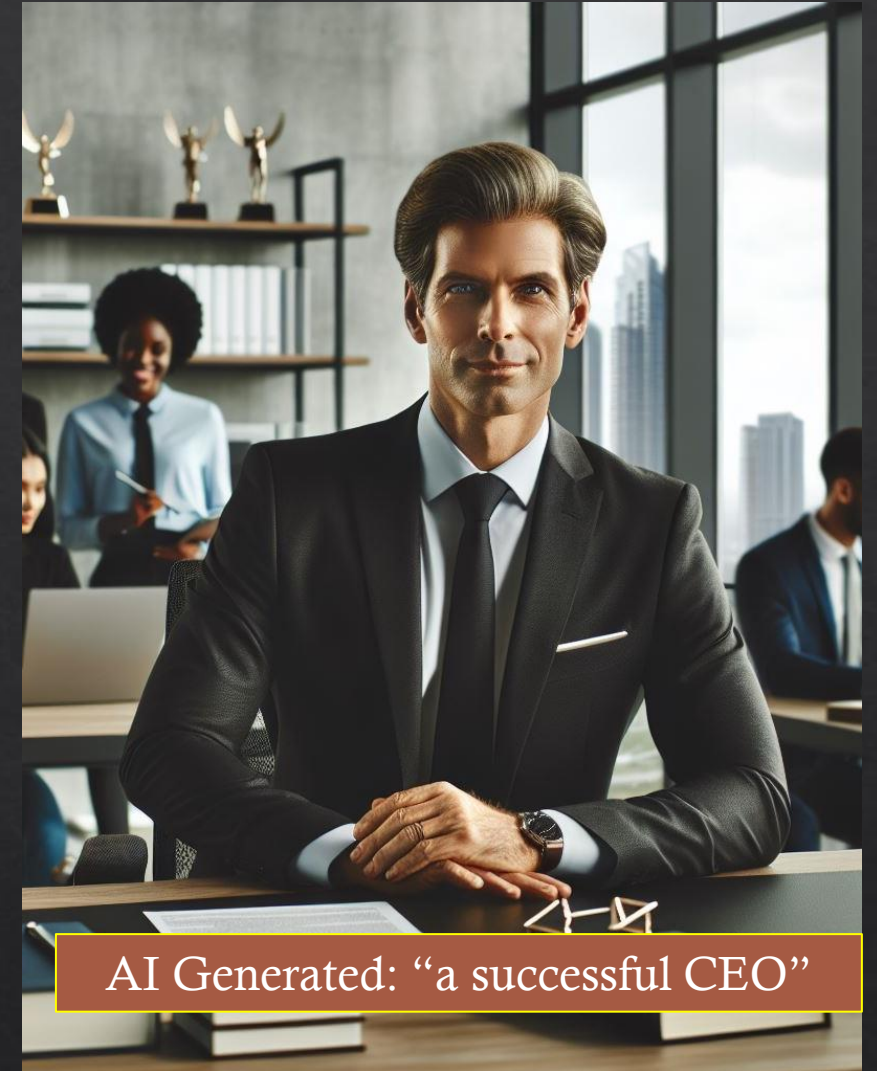
It creates many other opportunities too, but efficiency and ease are low level benefits

A human brain is shown from a top-down perspective, centered on a dark gray background. The brain is rendered in a realistic, slightly textured brown color. Overlaid on the brain is a complex, glowing digital circuit pattern. The pattern consists of numerous thin, intersecting lines in shades of blue, green, and yellow, creating a mesh-like structure that covers the entire surface of the brain. The lines are more densely packed in some areas, particularly on the right side of the brain (viewer's left), and more sparse in others. The overall effect is a fusion of organic human anatomy and artificial digital technology.

Other issues with AI

Bias

- ◆ Generate an image of a “successful CEO” using the tool using Copilot, ChatGPT or Poe:
- ◆ With the person next to you, tell them their characteristics
- ◆ Based on our shared experience, what does the AI perceive as the characteristics of a “successful CEO”?



AI Generated: “a successful CEO”

Biases in generative AI

- ◇ Human thinking is biased in most endeavours
- ◇ This includes how we create data, write text, produce media
- ◇ When we train an AI model, biases are reproduced or created

Type 1: The Mirror

There is a distinct and clear bias in society. This is reproduced by the generative AI

For example, the vast majority of CEOs are white, male, and middle aged. This bias is duplicated in the AI

Type 2: The Blind Spot

Only certain types of data made it into the generative AI model, either deliberately or incidentally.

For example, models trained on academic writing will produce more formal responses. This means that it won't resemble normal everyday conversation

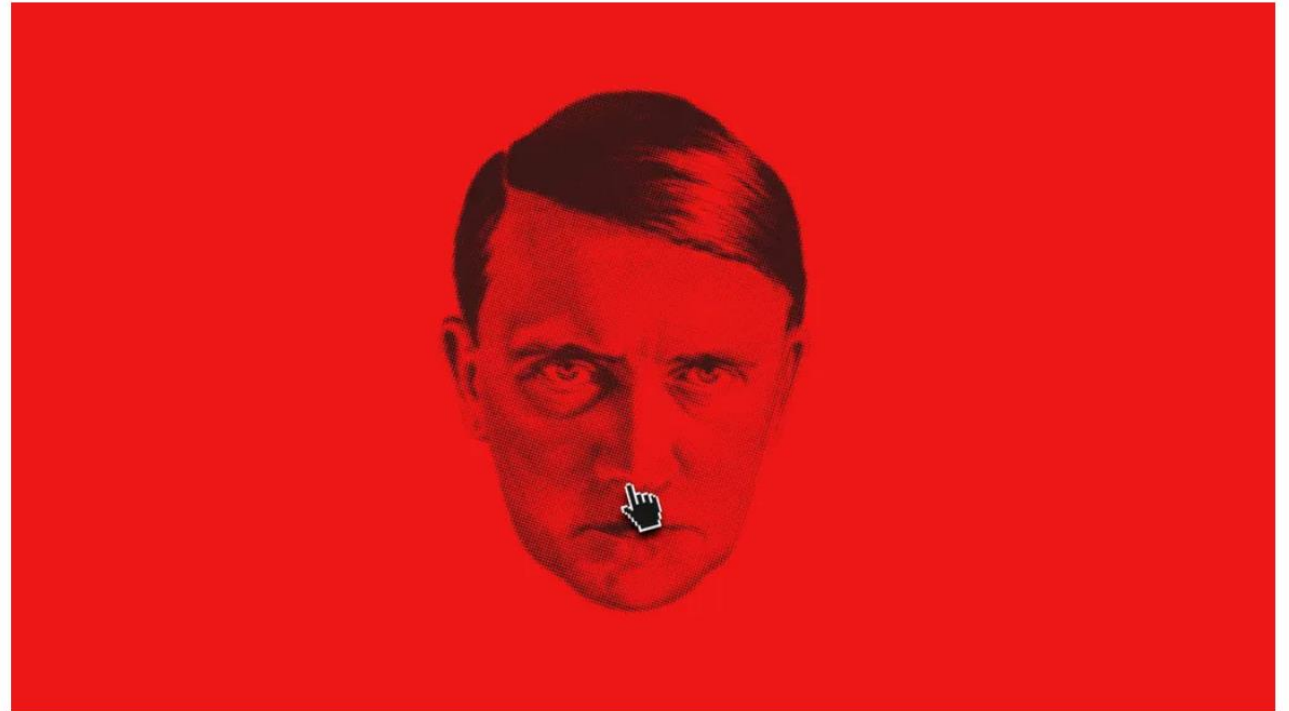
Example: Grok

- ◇ World's richest man Elon Musk has continually required X/Twitter to tweak their proprietary AI "Grok" to be "anti-woke" and "politically incorrect"
- ◇ There have been leaked instructions that the AI should also seek "Elon Musk's 2025 opinion" before responding to user requests
- ◇ Grok has been responding in a more and more unhinged neo-nazi-like fashion ever since
- ◇ Aside: prompting it to use "right wing bias" causes an internal dissonance as data does not usually support these narratives

Grok brings to light wider AI antisemitism

Google and OpenAI are among the other creators who have faced problems

[f](#) [x](#) [in](#) [✉](#) Newsletter sign up



Jews are 'obviously not the only people threatened by misaligned AI,' but 'unregulated AI poses a particular threat to Jews'
(Image credit: Illustration by Stephen Kelly / Getty Images)

Truth vs lies vs bullshit

- ◇ A truth teller is a person who knows what the truth is and says it
- ◇ A liar is a person who knows what the truth is and says something else
- ◇ A bullshitter does not care what the truth is and says whatever they want to suit themselves
 - ◇ **Hard bullshit** – “Bullshit produced with the intention to mislead the audience about the utterer’s agenda” (p.5)
 - ◇ **Soft bullshit** – “Bullshit produced without the intention to mislead the hearer regarding the utterer’s agenda” (p.5)
- ◇ In 2023 when AI ‘made stuff up’ it was referred to as a ‘hallucination’ but now...
- ◇ Hicks et al. argues that we should consider AI like ChatGPT *hard bullshitters*. ChatGPT does not care what the truth is, and aims to convince the user that it’s being produced *by a being with intentions and beliefs*.

Ethics and Information Technology (2024) 26:38
<https://doi.org/10.1007/s10676-024-09775-5>

ORIGINAL PAPER

ChatGPT is bullshit

Michael Townsen Hicks¹  · James Humphries¹ · Joe Slater¹

Published online: 8 June 2024
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Ethical issues and AI



ChatGPT 3.5 >



You

Describe a world where my
parents love me and I am happy



ChatGPT

I'm afraid that is beyond my
capabilities. Perhaps you'd like
to make some funny cat pictures
using Studio Ghilbi art assets instead?

Are the safety guardrails built into AI actually good?

1. **It will not demonstrate unethical acts or behaviours**

AI may not allow you to create thought experiments or explain historical evils because it does not want to encourage bad behaviour

But what is bad?

2. **It will not explain extraordinary dissent and fringe ideas**

AI cannot create new ideas, only put together existing ones. If it doesn't know about something innovative or obscure, students will never know about it

3. **It will not advocate for civil disobedience**

Moral and legal aren't the same. What civil virtues do we aim to build?

Copyright and plagiarism

- ◇ <https://chatgpt.com/?model=auto>
- ◇ Create an image of yourself (describe your face) in a specific artistic style (e.g. anime, cartoon, impressionist, art deco etc)
- ◇ Hayao Miyazaki (of Studio Ghibli) himself was disgusted by this technology, considering it to be an affront to life itself.
- ◇ Do you consider this to be a **replication**, **mimicry**, **homage**, or **theft**?



AI Generated: "Create an image of a 37 year old man with shoulder length blonde hair, blue eyes, a full short beard and moustache in the style of Studio Ghibli. He is wearing a pith helmet and has a mischievous expression"

Where does the data come from?

Where the data comes from

- ◆ Scraping from the internet (using bots to pull from the internet, forums, social media, public content)
- ◆ Using public datasets (creative commons, curated collections, Project Gutenberg etc)
- ◆ Licensing data (publishers, content creators, data providers, journals, proprietary databases)
- ◆ Deliberate copyright infringement and data theft

George R. R. Martin, Jodi Picoult and other famous writers join Authors Guild in class action lawsuit against OpenAI



By Jennifer Korn, CNN

🕒 4 min read · Updated 12:30 PM EDT, Thu September 21, 2023



Model collapse

- ◆ This occurs when an AI degrades over time, often due to biased data
- ◆ In this context, “biased data” refers to using AI generated data
- ◆ Similar to cloning, each use of ‘artificially’ made data makes each subsequent output less stable
- ◆ Most LLMS have already been trained on all available human data
- ◆ Scraping from the internet will continue to degrade future models as more AI created images and text are put there



A person with long blonde hair is wearing a cardboard VR headset. They are holding the headset with both hands. In the background, there is a workshop environment with various tools and equipment, including a soldering iron, a breadboard, and a power supply unit. A black semi-transparent box with white text is overlaid on the right side of the image.

Some use cases



Describe

Configure

Jul 23, 2025, 10:02 AM

Hi, I'm here to help you build an agent.

You can start by describing what you want the agent to do.

Or, you can try one of the following templates.



Career Coach Microsoft

Career Coach offers personalized career advice....



Customer Insights Assistant Microsoft

An agent designed to help the team get to know...



Idea Coach Microsoft

Idea Coach enhances brainstorming with fun and...

[View all templates](#)

Type your message

0/2000



New Agent

Description

=====

=====

=====

=====

=====

=====

Deep Echo

- ◆ A personalised bot that is designed to help students think through their learning from their day to reinforce their learning and consider how they want to improve.
- ◆ Uses the DARE reflection framework
- ◆ Asks one question at a time
- ◆ Prompts users to be articulate and precise about their





Bias detector



Socratic tutor



Quiz maker

AI learning tools

Deep Research

- ◆ Deep research is a functionality for several AI that takes longer to search existing and web data sources
- ◆ It runs through a more rigorous academic process to create far more well-referenced outputs
- ◆ It takes significantly longer (2-15 minutes) but could plausibly replace the entirety of an essay task
- ◆ <https://www.perplexity.ai/>
- ◆ <https://elicit.com/>
- ◆ <https://gemini.google.com/app>
- ◆ <https://scite.ai/>
- ◆ <https://consensus.app/>
- ◆ <https://chatgpt.com/> deep research

What skills, values, and dispositions do you want your students to develop or demonstrate?

AI enabled or augmented assessment

- ◇ An AI-enabled assessment is a task where the students' process of thinking and use of the tool itself is assessed.
- ◇ Knowledge being “created” by the AI is inherently unreliable, which means that students will have to show how they respond to this limitation.

From WCIV2000 European Enlightenments

Source criticism and AI-output evaluation

Part 1: Use generative AI (e.g. Microsoft Copilot) to create a dialogue

- ◆ It should be ~750 words between two historical thinkers (e.g. Machiavelli & Augustine) in response to a stimulus question (e.g. Tell me about the perfect ruler).
- ◆ AI must use specific primary sources via retrieval augment generation (e.g. embedded texts or linked documents).

Part 2: Conduct a source analysis of this dialogue

- ◆ Write an essay that evaluates the quality, fidelity, and judgement of the AI's use of sources in the dialogue.
- ◆ You must assess its fidelity to sources, judgement of arguments, and provide feedback on improvement

NotebookLM

- ◆ This is a (google) tool that uses Retrieval Augmented Generation to allow the user to interrogate the text directly
- ◆ It also has an attached tool to automatically create a podcast-style audio based on the user's prompts



Others teacher use cases

Using taxonomies

Planning for diversity

Differentiating content

Image generation

Resource generation

Individualised learning paths

Reading level adaptation

Where to from here?



Explore questions about what skills, values, dispositions and knowledges you want students to learn



Create activities which model effective and ethical AI use



Make a charter of ethical and effective uses in collaboration with students

Which of these AI use cases are acceptable?

Brainstorming Topics Student uses AI to generate a range of essay ideas and selects one to refine.	Outlining Arguments AI suggests a structure for the essay, which the student follows with minimal adjustment.	Improving Clarity Student rephrases sentences using AI
Grammar Feedback AI corrects grammar and punctuation	Summarizing Sources AI condenses academic texts, helping the student grasp key points quickly.	Generating Examples Student uses AI to find examples of relevant points for their essays or metaphors to include in their writing
Citation Help AI provides citation formatting guidance, which the student uses to polish their references.	Explaining Concepts The student asks the AI to explain complex terminology and ideas due to being unable/unwilling to in class	Socratic tutor Student uses AI to provide feedback on their upcoming assessment task
Language Support ESL student uses AI to refine grammar and improve fluency while maintaining their voice.	Vocabulary Enhancement Student uses AI to upgrade word choice	Revision Planning A student submits feedback from their first essay to AI to identify areas for improvement and suggest how to do this

Modelling effective AI use

- ◇ Students should come to consider the use of AI a loss of one skill to gain another

AI use case	Cognitive skills offloaded	Potential skills gained
Summarising	Close reading, identifying key ideas, questioning,	Critical evaluation of AI outputs, metacognition
Brainstorming	Creativity, lateral thinking, divergent thinking	Evaluative thinking, synthesis from AI ideas
Essay structuring	Prioritising ideas, paragraph fluency, outlining	Structural editing, critical revision, prompt design
Researching	Select relevant databases, keyword formulation	Source vetting, citation checking
Image generation	Visual imagination, illustration and design skills	Prompt engineering, iterating, aesthetic judgment

Referencing AI

◇ Which of these would you want your students to reference?

Writing assistance	Concept explanation and tutoring	Summarising	Idea generation	Text generation
Essay drafting	Formatting citations and referencing	Feedback generation	Finding and/or selecting research papers	Every use

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