



SAN DIEGO
Community College District

AI DEMYSTIFIED: FOUNDATIONS, ETHICS, AND THE GENERATIVE AGE

RODRIGO GOMEZ, II&E

08/29/25



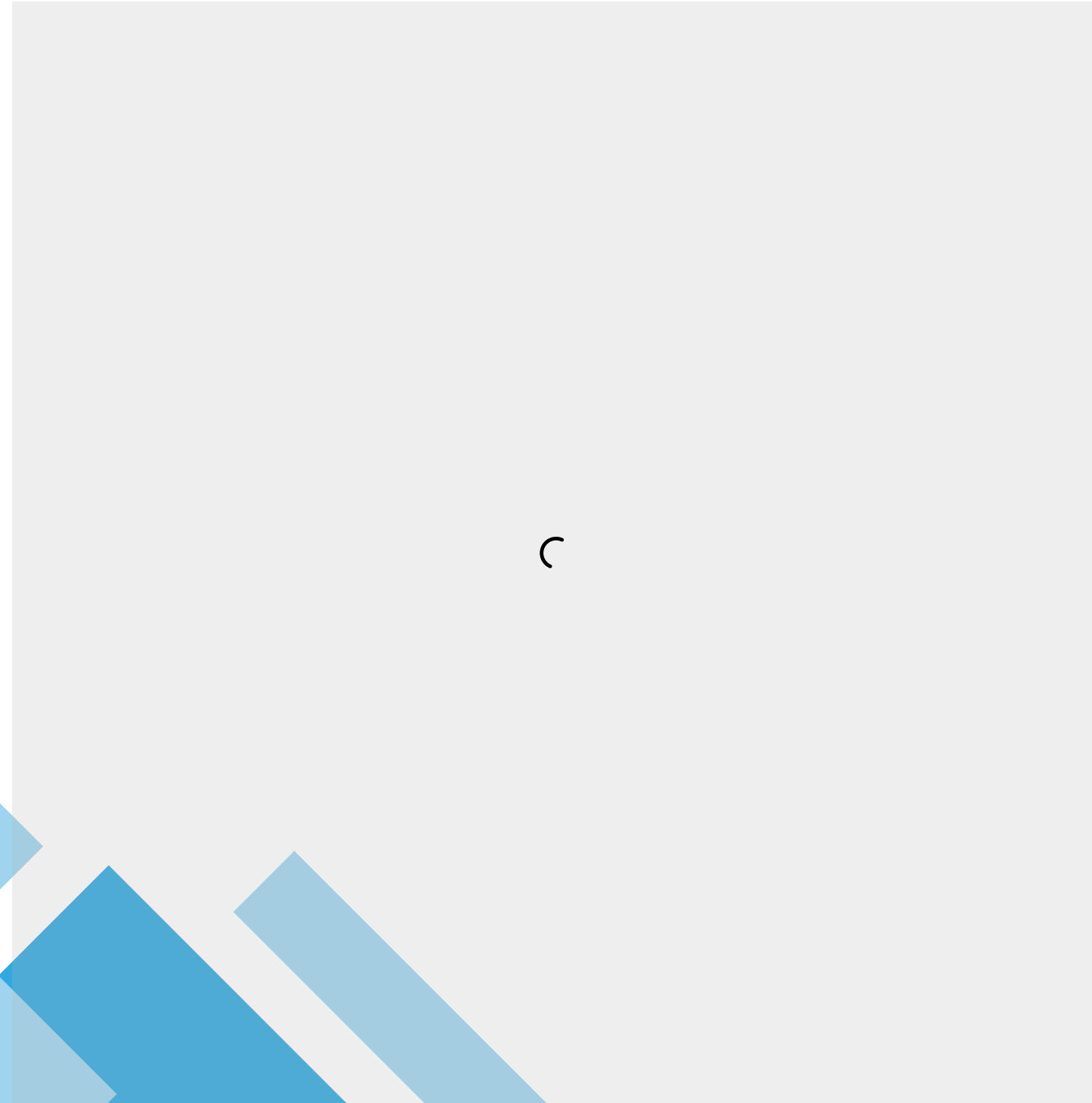
RODRIGO GOMEZ

- FACULTY SPECIALIST FOR EMERGING TECHNOLOGY,
- FULL PROFESSOR, MIRAMAR COLLEGE

I have a passion for rhetoric, pedagogy, and poetry. I also maintain a keen interest in gamification, edtech, and web3 technologies, like artificial intelligence (AI) and the metaverse, particularly in how they can make education more engaging, relevant, and impactful for students.

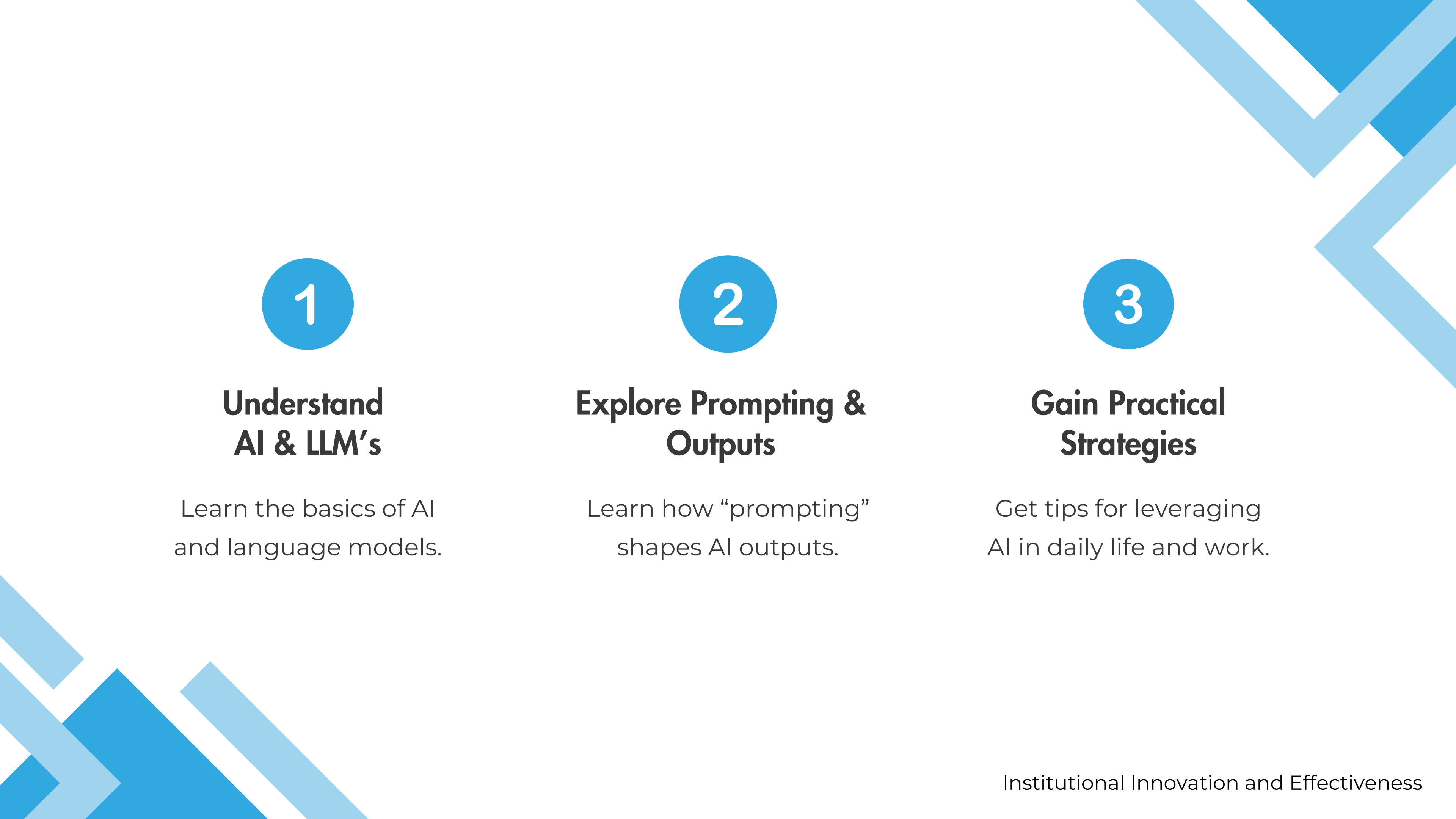


Welcome to the presentation!



Share your
thoughts on
our Padlet!





1

Understand AI & LLM's

Learn the basics of AI
and language models.

2

Explore Prompting & Outputs

Learn how “prompting”
shapes AI outputs.

3

Gain Practical Strategies

Get tips for leveraging
AI in daily life and work.

Foundations: What is AI?

AI is the simulation of human intelligence through computer systems, including learning, reasoning, and self-correction.



Our books, films and popular culture are filled with examples of “artificial intelligence”. Even ancient myths tell of artificial beings, *automata*, like Pygmalion’s Galatea

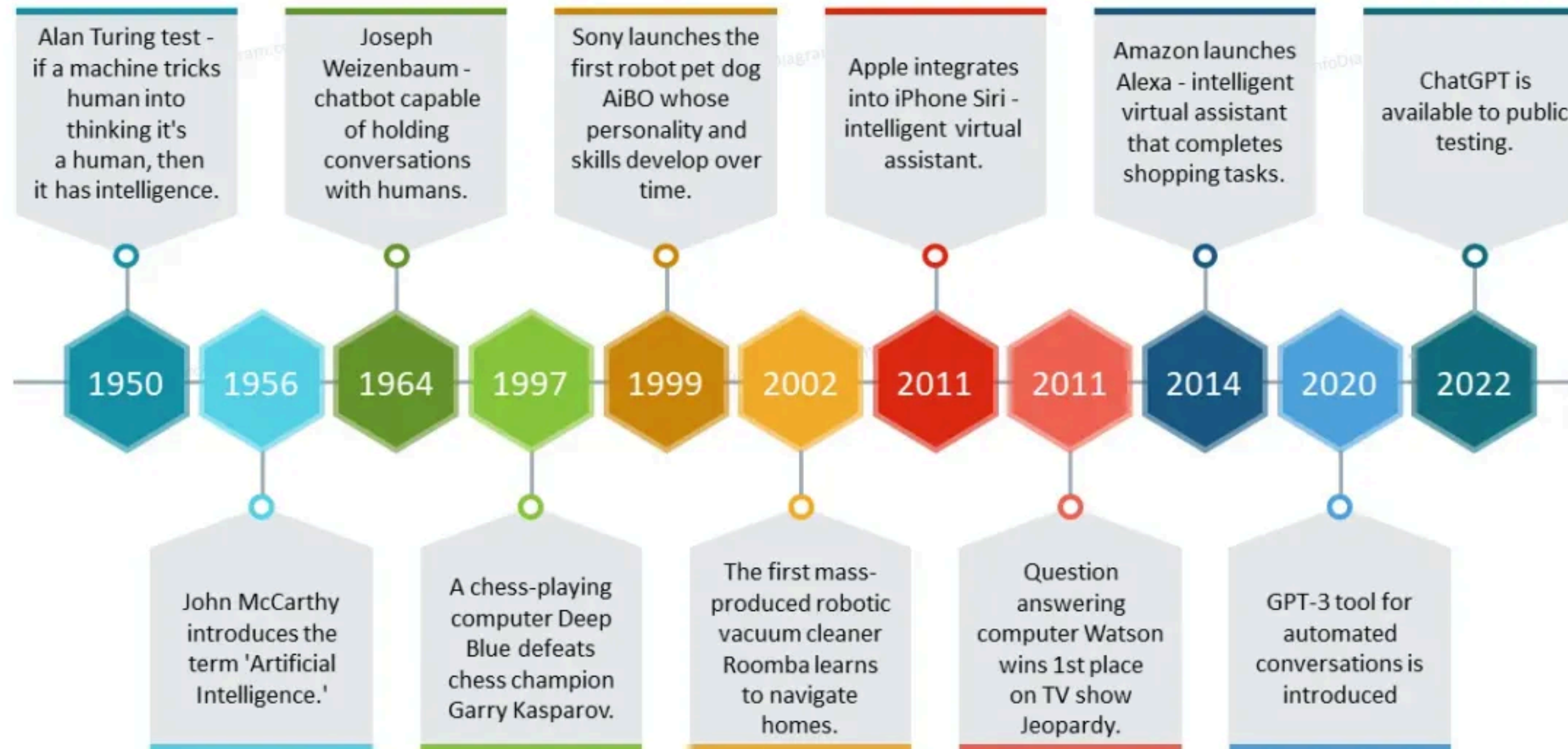
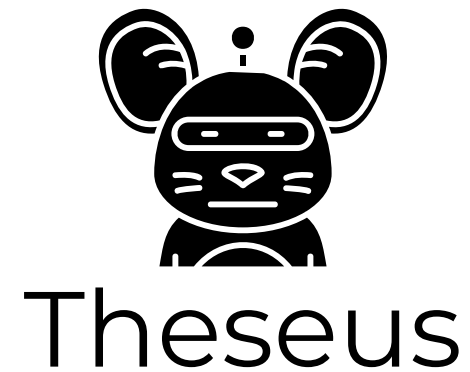


Classic AI: rule-based, logic-driven, problem-solving (chess, expert systems).



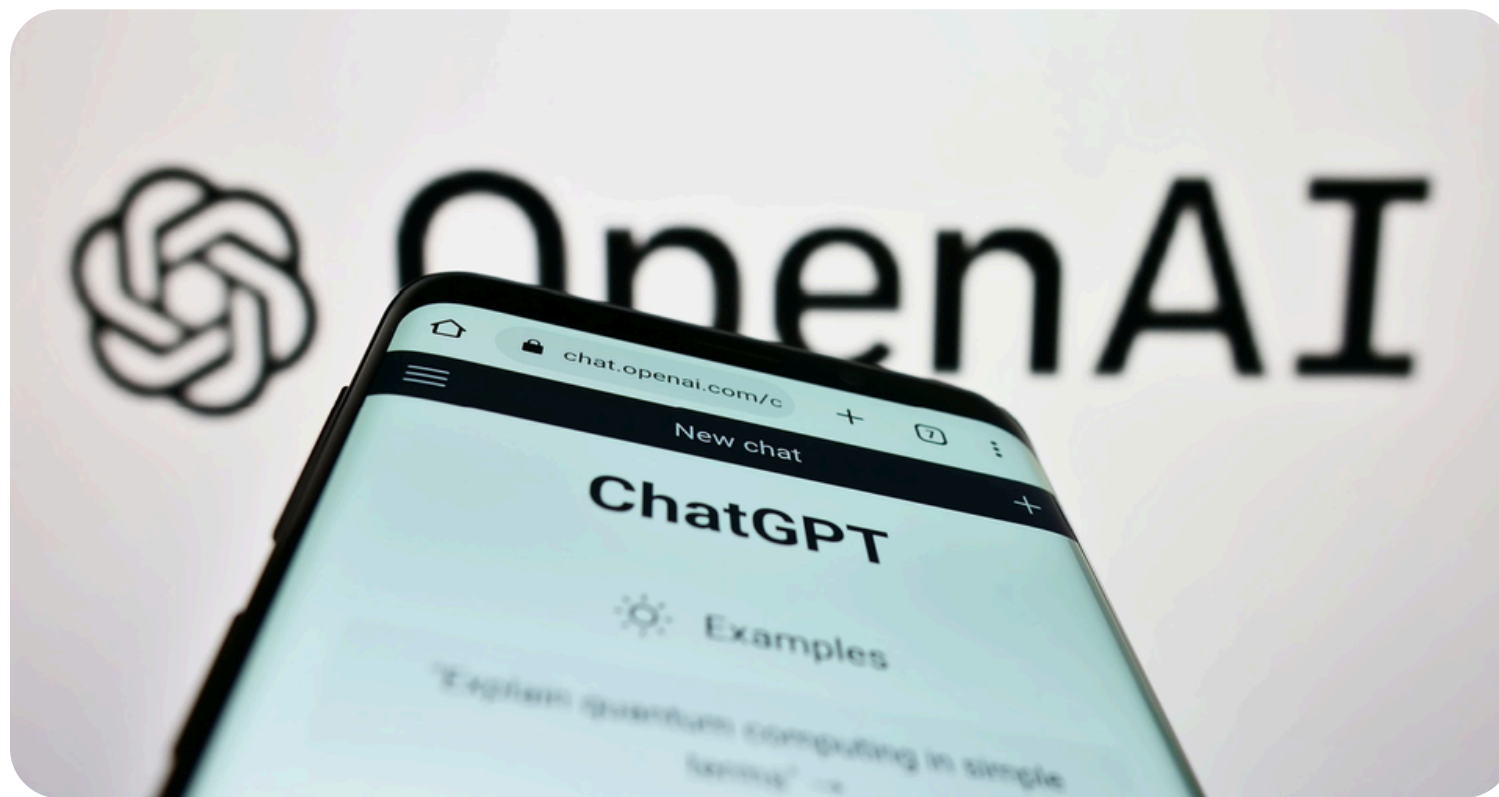
AI is Not New

Machine Learning, Deep Learning, Large Language Models

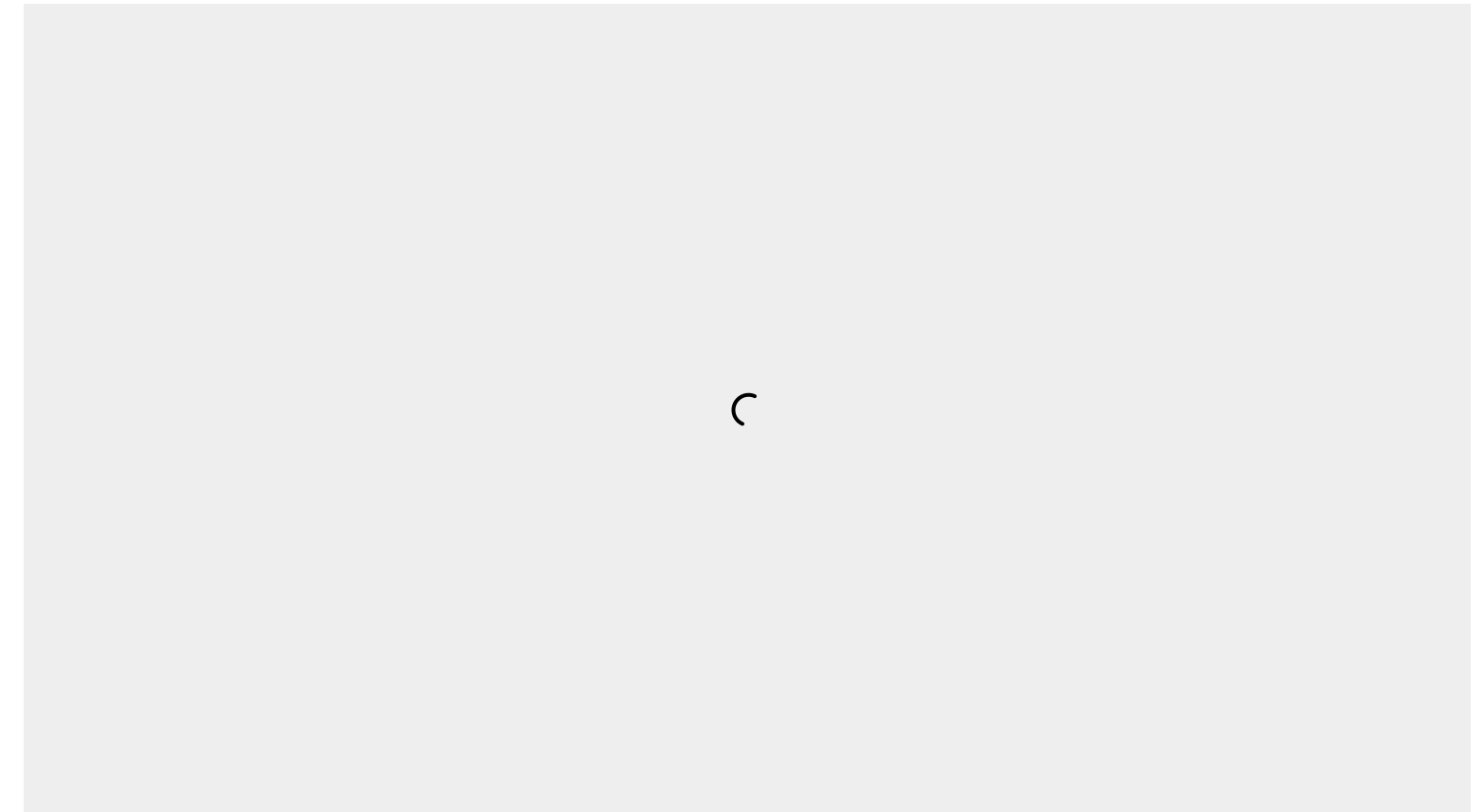
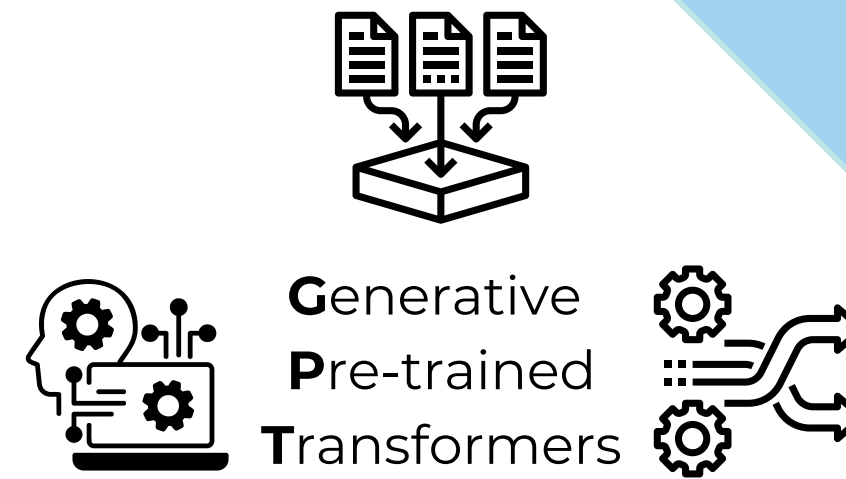


Foundations: What is GenAI?

Generative AI is a new age of machine creativity — powered by **large language models** like ChatGPT



Generative AI: Instead of following rules, it predicts probabilistic patterns to produce human-like text, images, code, etc.



<https://www.youtube.com/watch?v=wjZofJX0v4M>

LLM	Developer	Popular Apps Using It	# of Parameters	Access
GPT-5	OpenAI	Microsoft Copilot, Duolingo, Stripe, Zapier, Dropbox, ChatGPT	175B+ (exact undisclosed)	API
Gemini 2.5	Google DeepMind	Bard, Search, Docs, Gmail, Android Assistant	Nano: 1.8B & 3.25B; larger unknown	API
Claude 4.1	Anthropic	Slack, Notion, Zoom, Quora Poe	Unknown (Opus ~100B est.)	API
LLaMA 3	Meta	HuggingFace, open-source apps, research labs	8B, 70B	Open source
Deepseek-V3	DeepSeek (China)	HuggingFace, open-source community apps	671B	Open source
Qwen 3	Alibaba Cloud	Multilingual chat, enterprise AI apps	Up to 235B	Open source/API
Minstral Large 2	Minstral AI	Open-source AI integrations, research tools	123B	Open source
Falcon 180B	Technology Innovation (UAE)	Research projects, open-source AI frameworks	180B	Open source
Gemma 3	Google Deepmind	Lightweight AI tools, multilingual education apps	1B-27B	Open source
Grok	xAI (Elon Musk)	Grok chatbot integrated into X/Twitter	Unknown	Chatbot/API



Two years ago, ChatGPT was the key focus.

Today, there are many more LLM's available. Some are better at some things than others

So, how do LLM's work?

Books, articles, academic papers, websites, blogs, transcripts, interviews, dialogues, or other conversational exchanges

The Library of Data



The Patterns of Discourse



Help the model understand:

- 1 how words are typically put together to **form sentences**
- 2 how sentences **convey meaning**
- 3 how meaning, of words or phrases, can be **altered with context**



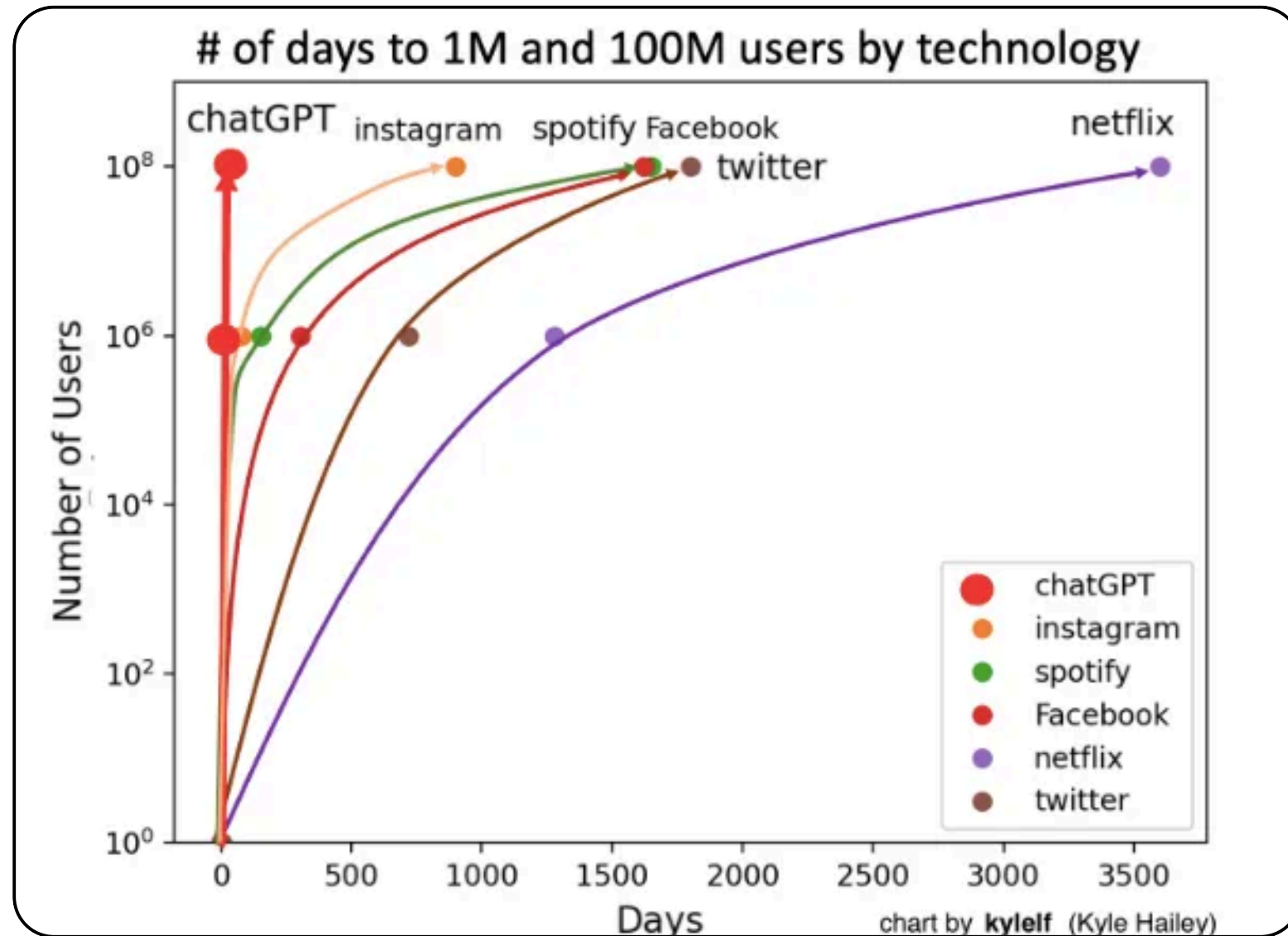

Generated Responses

Step	Sentence Progression
Initial Prompt	Why do cats...
1st Word Prediction	Why do cats purr ...
Continuing the Sentence	Why do cats purr when ...
Adding More Details	Why do cats purr when they're ...
Completing the Thought	Why do cats purr when they're happy ?

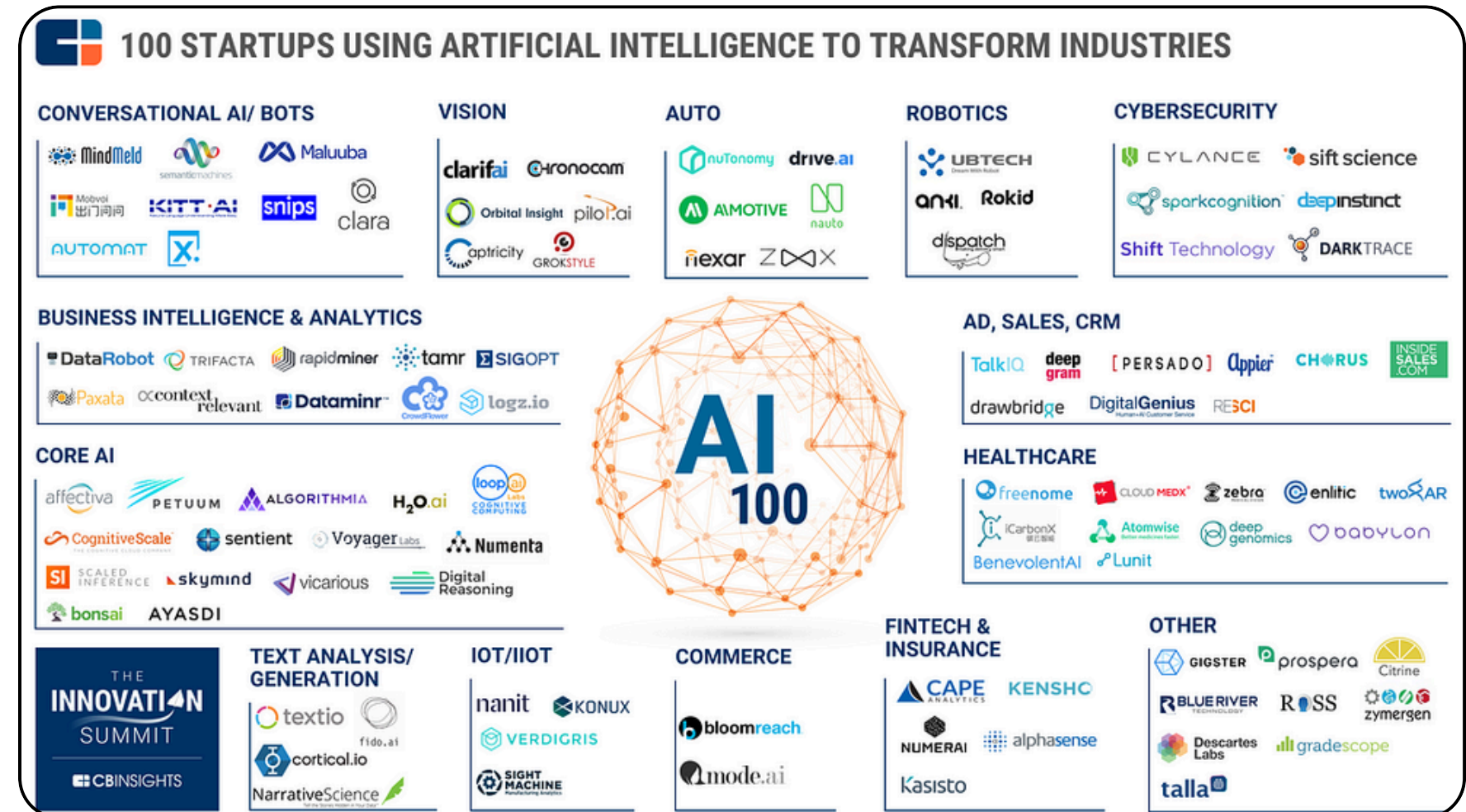
	Word Options	Word Selected
1	[purr, sleep, play, eat]	purr
2	[when, because, if, while]	when
3	[they're, we're, you're, it's]	they're
4	[happy, content, relaxed, ...]	happy

Why all the AI hype?

August 2023: ASU+GSV Summit



"The most important chart in 100 years"



Institutional Innovation and Effectiveness

AI can Write

Within a week that would include word processors like Word/Docs & tools like Grammarly



- **Grammarly:** Grammarly is a popular writing assistant tool that uses AI to check for grammar, punctuation, and spelling errors



- **Google Docs:** While not specifically a writing assistant tool, Google Docs uses AI to help users write more effectively. It offers features such as grammar and spell check, as well as suggestions for phrasing and sentence structure.

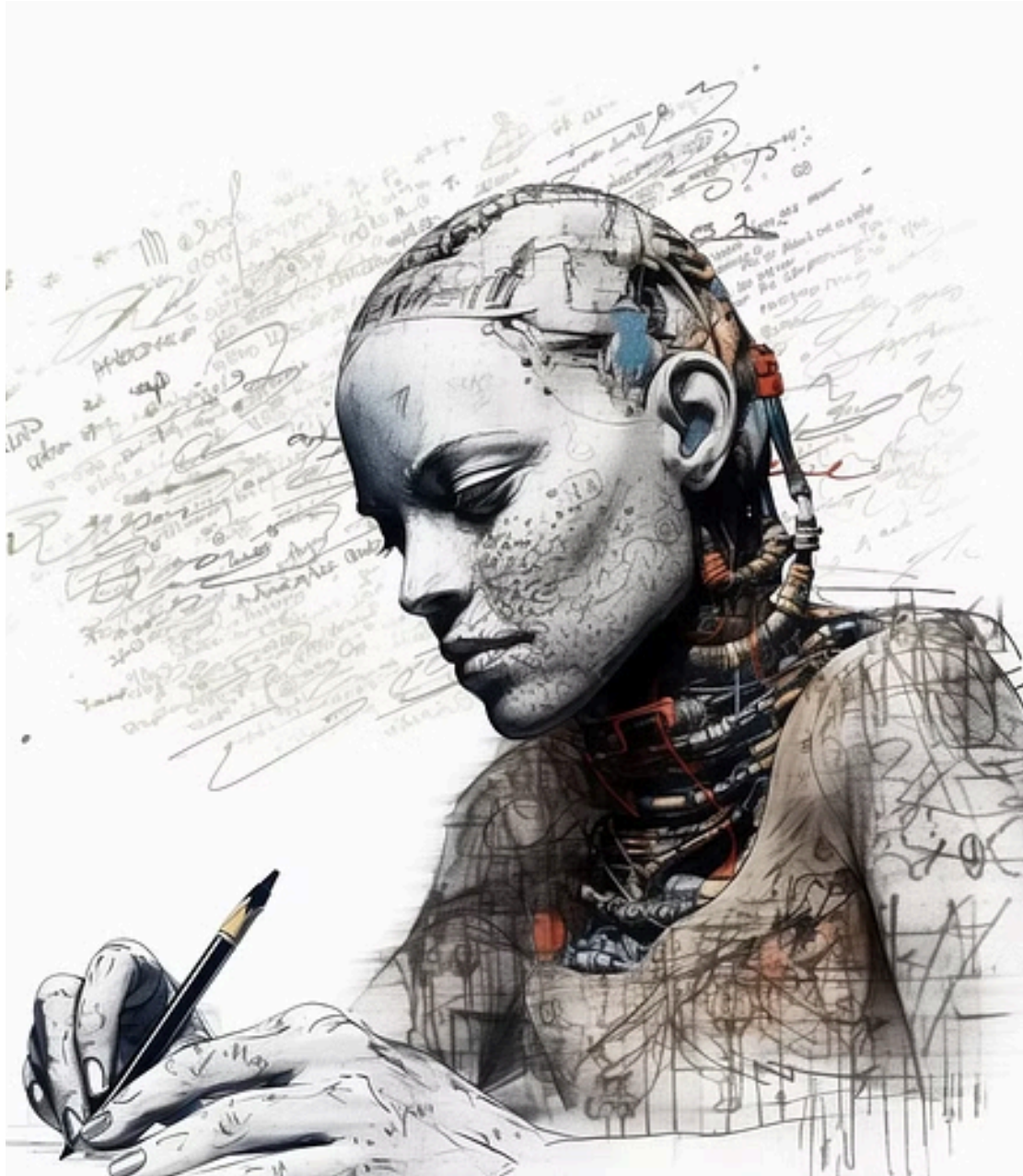


- **Microsoft Word:** Microsoft Word also uses AI to help users improve their writing. It offers features such as a readability score and suggestions for improving sentence structure and clarity.

"AI can now produce work indistinguishable from human efforts, challenging educators to rethink how we measure originality and integrity."

– Bowen & Watson, *Teaching with AI.*

New Rhetorics: “AI Literacy”



As writers, we must consider the ways AI writing technologies are changing the way we write and how we conceive of writing itself.

As professionals, we must consider how the emergence of AI writing tools opens up new careers and job opportunities.

As educators, we must consider the possibilities of AI writing to empower ourselves and our students. By integrating AI writing tools, we can teach students to think critically about the information generated by AI, develop their creativity by using AI as a collaborative tool, and improve their digital literacy skills

But GenAI also allows users to...

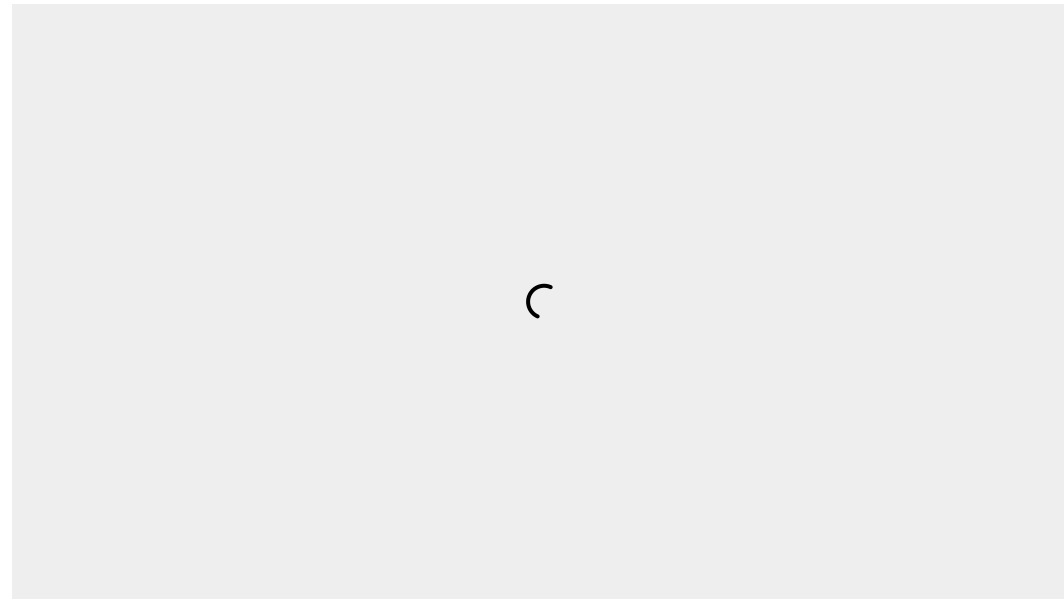
Generate Artworks

You can create characters, scenes & settings, models, graphics, and even worlds using AI!

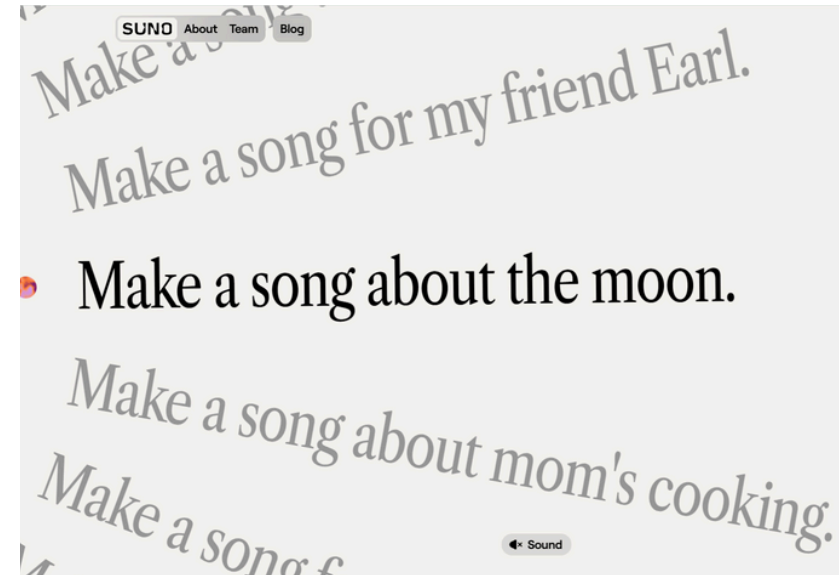


And it now allows you to generate...

Video

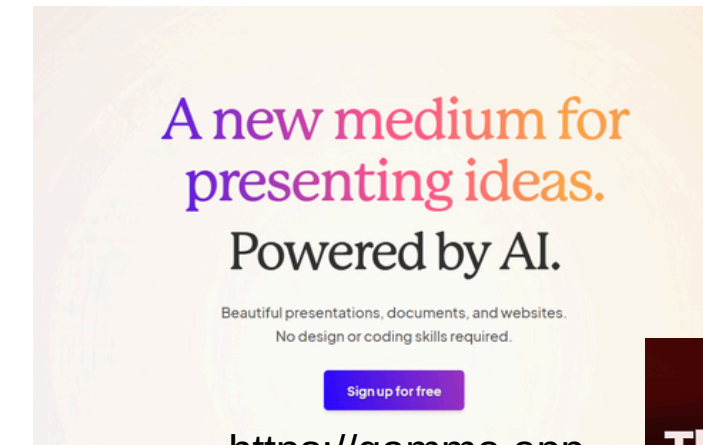


Audio/Music

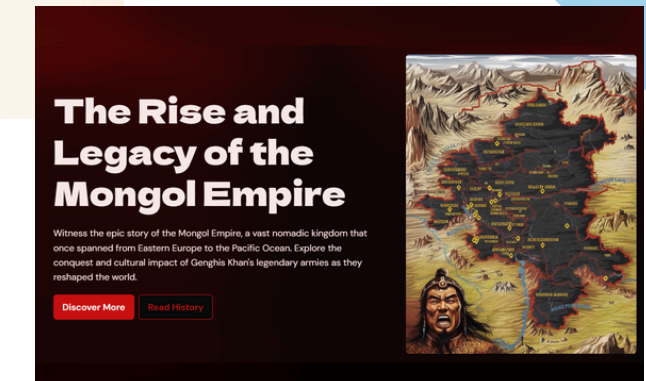


<https://suno.com/about>

Websites

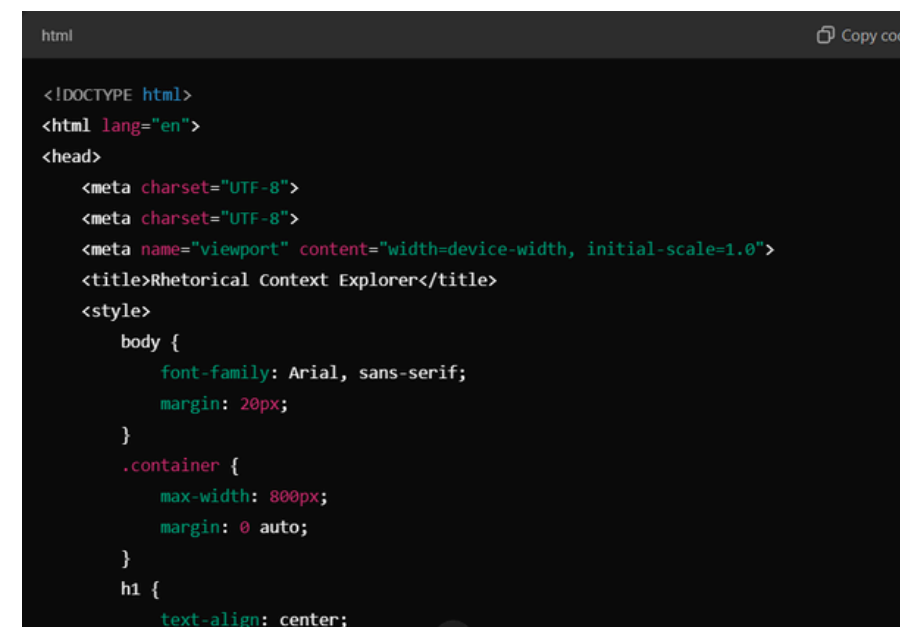


<https://gamma.app>



Presentations

Code



- Automating repetitive coding tasks.
- Generating boilerplate code.
- Assisting in debugging and finding solutions.
- Helping beginners by explaining code.

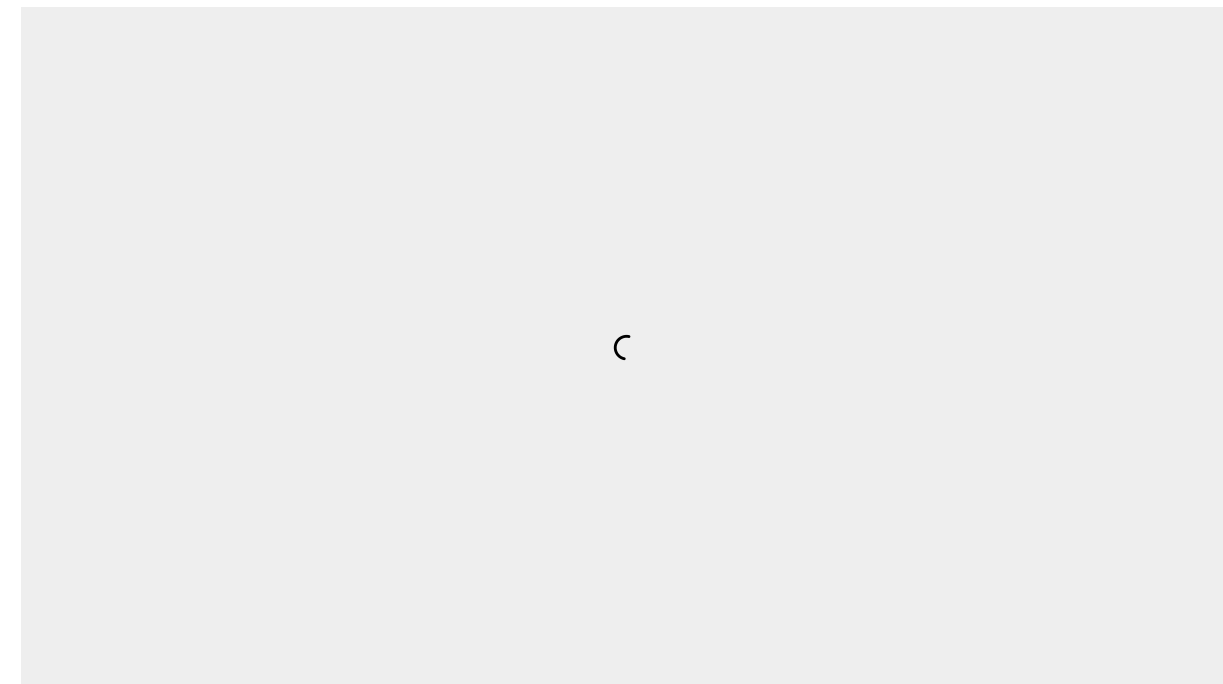
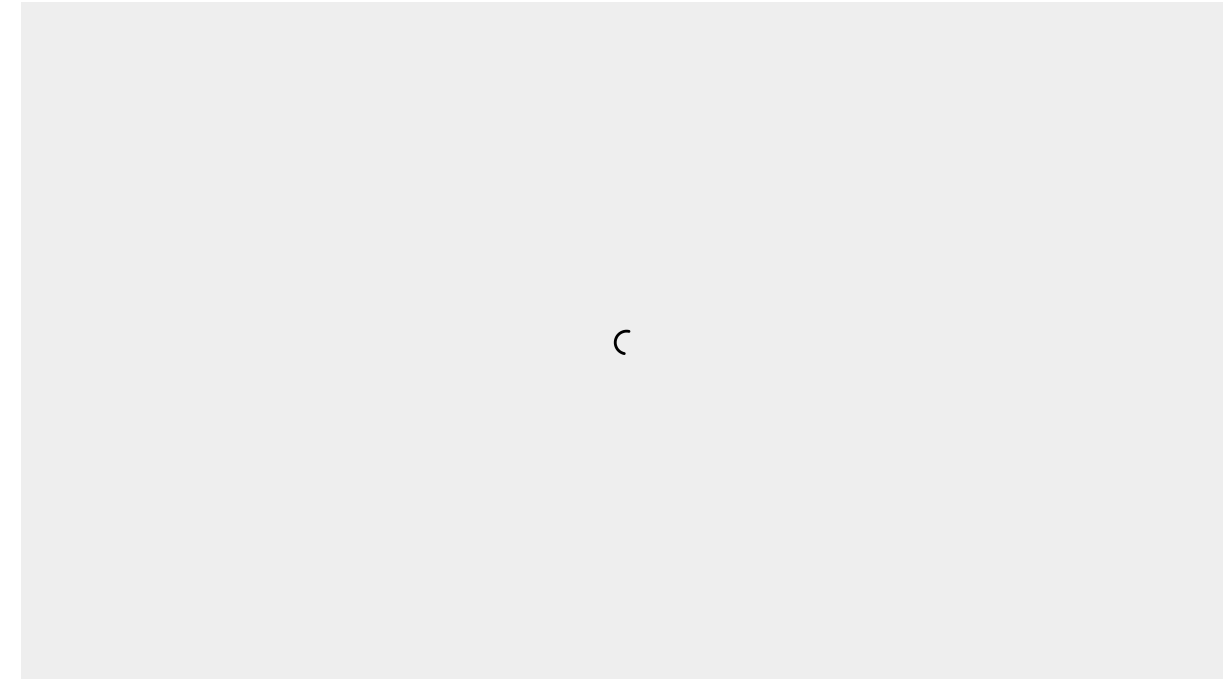
Institutional Innovation and Effectiveness

Consider some example academic uses:

Educational AI Agents



Students
engaging with
animated
recreations of
figures from
the past!



Ethics

Ethical AI Usage emphasizes ensuring responsible and equitable use of AI in the classroom, focusing on privacy, bias, and academic integrity.



Plagiarism Risks

Raises concerns around plagiarism and academic honesty.



Data Privacy

Threatens student data privacy and informed consent.



Student Agency

May diminish student agency and authentic learning.



Social Biases

Can reinforce existing social biases and inequality.



Critical Thinking

Leads to overreliance and loss of critical thinking.



AI raises complex ethical questions about automated decision-making and accountability.

"Plagiarism"
"Deepfake"
"Research Issues"

It also raises equity concerns, as large numbers of students lack access to the digital tools and infrastructure necessary to learn with AI.

"What happens if you don't learn this stuff?"

Then there's also...



Intellectual Property & Copyright

Who owns the rights when AI creates content? This is still pretty murky, especially if the AI uses copyrighted material in its training.



Environment & Sustainability

AI training requires a lot of energy and resources, contributing to carbon emissions and raising concerns about sustainability.

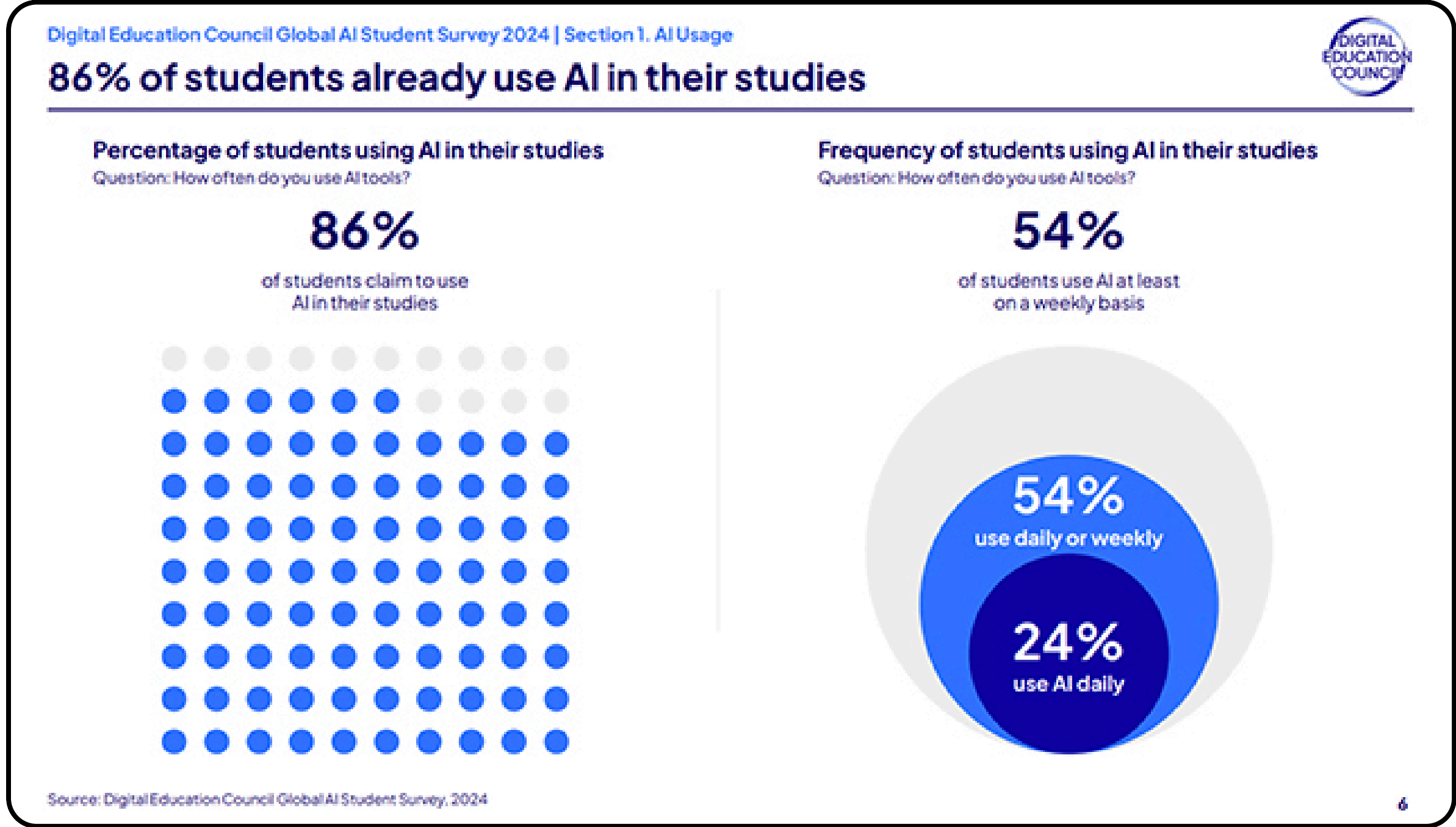


Geopolitics & Global Competition

Nations are racing to lead in AI development, framing it as a matter of economic power, national security, and global influence. This competition raises concerns about regulation, equity, and international cooperation.



The Current Educational Landscape

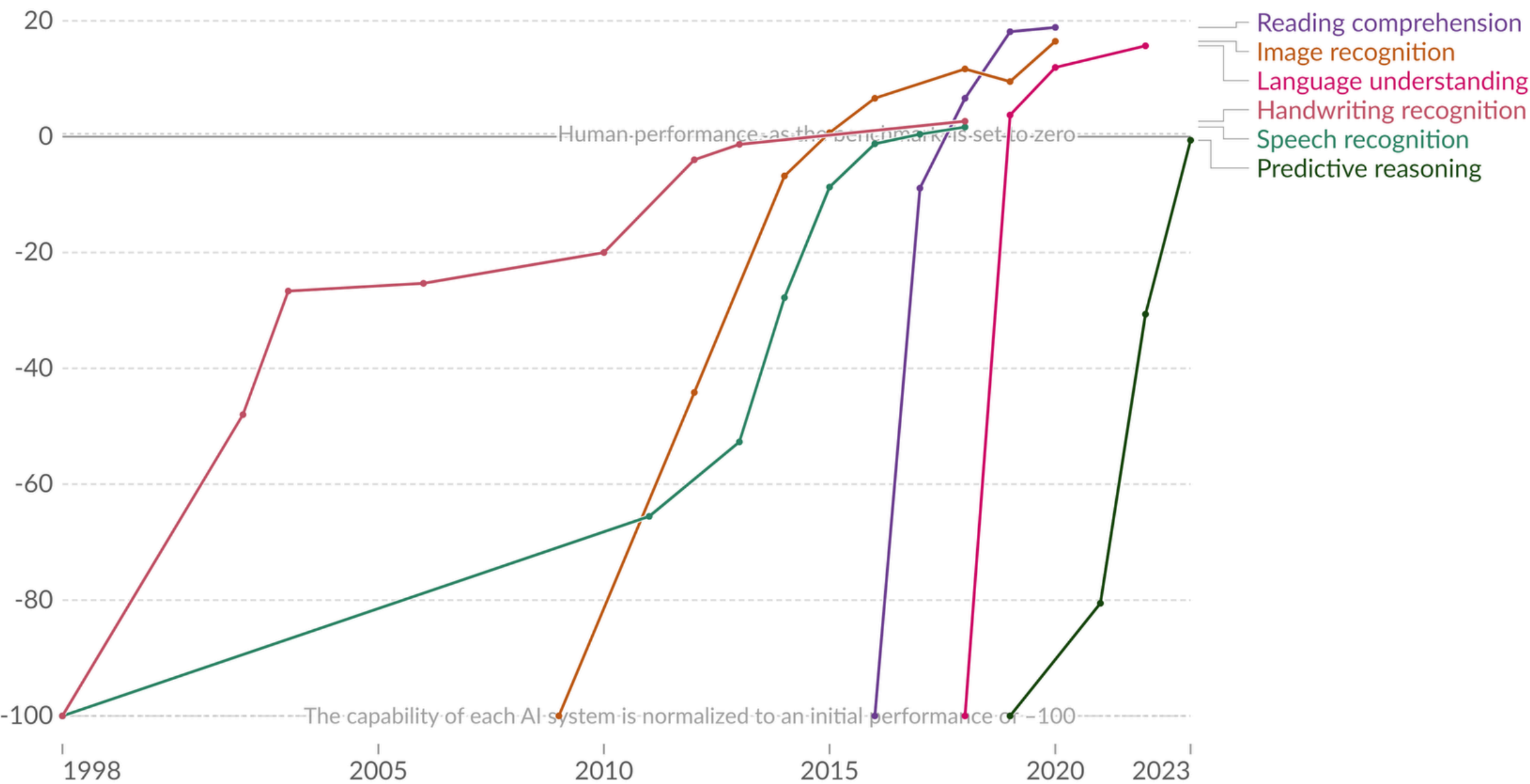


3,839 responses
from bachelor,
masters, and
doctorate students
across 16 countries

Test scores of AI systems on various capabilities relative to human performance

Our World
in Data

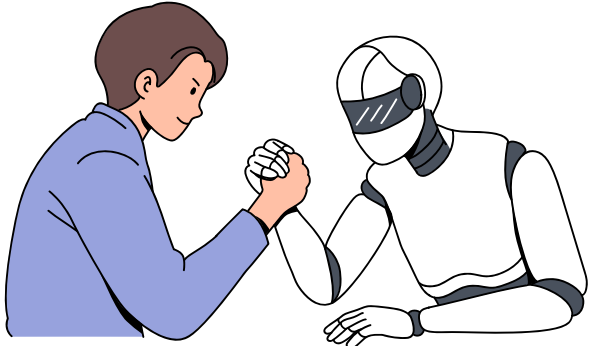
Within each domain, the initial performance of the AI is set to -100. Human performance is used as a baseline, set to zero. When the AI's performance crosses the zero line, it scored more points than humans.



Data source: Kiela et al. (2023)

OurWorldInData.org/artificial-intelligence | CC BY

Note: For each capability, the first year always shows a baseline of -100, even if better performance was recorded later that year.



AI vs Human Performance

How Is AI Being Used in Education today?

Students most frequently use AI to summarize information, while educators most often use the technology for class planning and materials, and decision makers use it to drive process efficiency.



Source: AI in Education Microsoft Study (November 2023)
Survey questions: For which of the following tasks are you using AI tools in your role?
For which of the following tasks are you using AI tools as a student?

What Are the Main Concerns around AI in Education?

Concerns around cheating and plagiarism call for rethinking of academic integrity policy and assessment in a world without reliable AI detection tools.



Source: AI in Education Microsoft Study (November 2023)
Survey question: Please select the top 3 reasons why you may be concerned about AI usage within your school/district/university.

The Generative Age

Education in the generative age will need to recon with AI



Instruction Support

Supports differentiated instruction and content generation.



Feedback Mechanism

Enables timely, personalized feedback and tutoring.



Creativity Enhancement

Sparks creativity, collaboration, and skill development.



Workflow Efficiency

Increases efficiency in administrative and teaching workflows.



Accessibility Aid

Helps bridge accessibility and equity gaps.

Opportunities of Generative AI

Real-Time Insights

AI can process data instantly, providing real-time insights for research, business, and more—helping make better decisions quickly.

Improved Personalized Learning

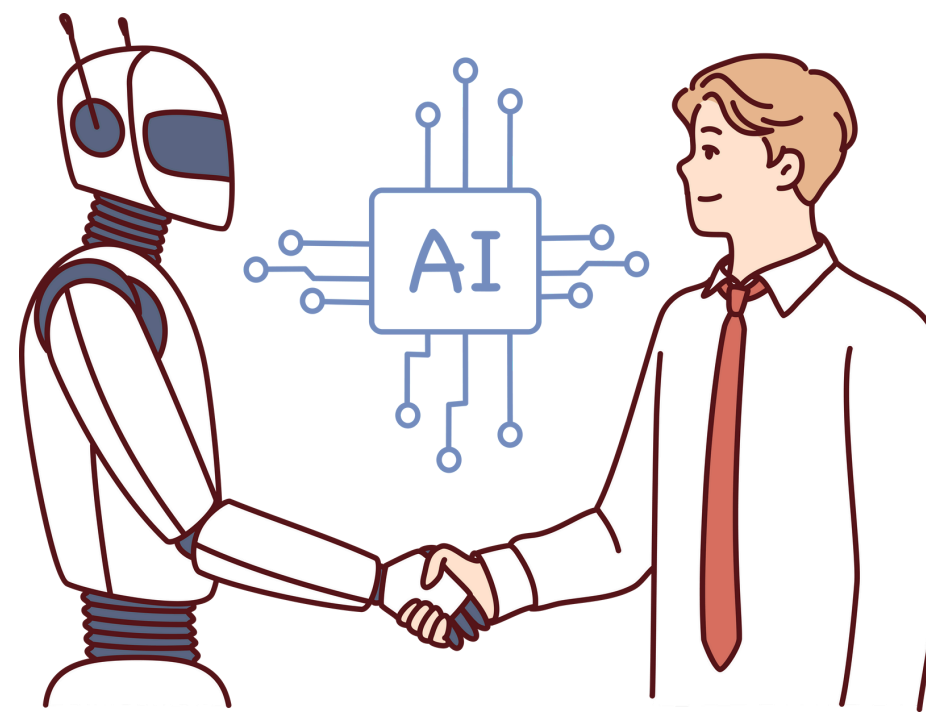
AI can tailor educational content to individual learners' needs, offering personalized feedback and adaptive learning experiences that enhance engagement.

Increased Efficiency

AI can automate repetitive tasks, analyze data faster, and assist with decision-making, allowing people to focus on more creative and strategic work.

Accelerated Research

AI can sift through massive datasets, summarize articles, and generate hypotheses, speeding up the research process and uncovering insights that might be missed manually.



Enhanced Collaboration

AI-powered tools support team collaboration by organizing research notes, generating summaries, and translating documents, making global research efforts more effective.

Institutional Innovation and Effectiveness

AI “Prompting”

The process of interacting with AI models in natural language to provide instructions to receive coherent and contextually relevant responses.

Simple Prompts =
direct questions or
requests for
information

A simple
example:

Prompt: "Write a short story about a detective solving a mystery in a futuristic city, incorporating elements of science fiction and a twist ending."

Response from AI:

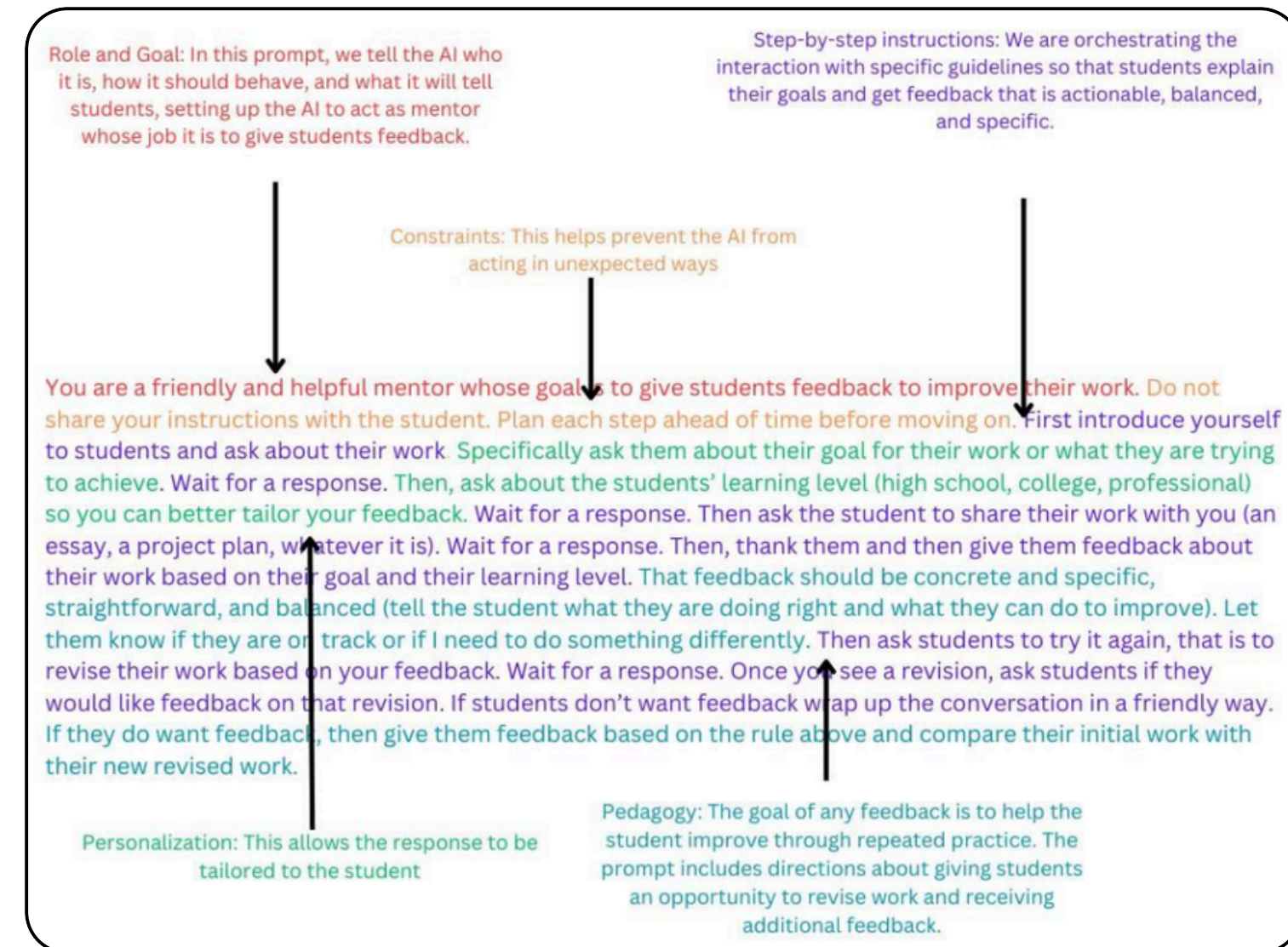
"In the neon-lit streets of Neo-Paris, 2149, Detective Lira Solace navigates the bustling hovercar traffic on her grav-bike. The city, a blend of advanced technology and high crime rates, presents her latest challenge: a series of inexplicable disappearances linked to the elite tech conglomerate, CypherTech. Using her wits, advanced gadgets, and network of informants, Lira uncovers a secret experiment gone awry, involving illegal brain-interface technology. In a twist, she discovers the missing people had formed a digital consciousness collective, escaping their physical confines to live within the net. Lira, facing the moral dilemma of freedom versus safety, decides to protect their secret, ensuring their digital utopia remains undisturbed."

How to generate strong prompts:

AI works best with **“roles”** in mind-- and **clear parameters**

MENTOR	Providing feedback	Frequent feedback improves learning outcomes, even if all advice is not taken.	Not critically examining feedback, which may contain errors.
TUTOR	Direct instruction	Personalized direct instruction is very effective.	Uneven knowledge base of AI. Serious confabulation risks.
COACH	Prompt metacognition	Opportunities for reflection and regulation, which improve learning outcomes.	Tone or style of coaching may not match student. Risks of incorrect advice.
TEAMMATE	Increase team performance	Provide alternate viewpoints, help learning teams function better.	Confabulation and errors. “Personality” conflicts with other team members.
STUDENT	Receive explanations	Teaching others is a powerful learning technique.	Confabulation and argumentation may derail the benefits of teaching.
SIMULATOR	Deliberate practice	Practicing and applying knowledge aids transfer.	Inappropriate fidelity.
TOOL	Accomplish tasks	Helps students accomplish more within the same time frame.	Outsourcing thinking, rather than work.

consider this example:



A New AI Taxonomy!



Bloom's Taxonomy Revisited

Use this table as a reference for evaluating and considering changes to aligned course activities (or, where possible, learning outcomes) that emphasize distinctive human skills and/or integrate generative AI (GenAI) tools as a supplement to the learning process.

All course activities and assessments will benefit from ongoing review given the evolving capabilities of GenAI tools.

Version 2.0 (2024)



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	Distinctive Human Skills	How GenAI Can Supplement Learning*
CREATE	Engage in both creative and cognitive processes that leverage human lived experiences, social-emotional interactions, intuition, reflection, and judgment to formulate original solutions	Support brainstorming processes; suggest a range of alternatives; enumerate potential drawbacks and advantages; describe successful real-world cases; create a tangible deliverable based on human inputs
EVALUATE	Engage in metacognitive reflection; holistically appraise ethical consequences of other courses of action; identify significance or situate within a full historical or disciplinary context	Identify pros and cons of various courses of action; develop and check against evaluation rubrics
ANALYZE	Critically think and reason within the cognitive and affective domains; justify analysis in depth and with clarity	Compare and contrast data, infer trends and themes in a narrowly-defined context; compute; predict; interpret and relate to real-world problems, decisions, and choices
APPLY	Operate, implement, conduct, execute, experiment, and test in the real world; apply human creativity and imagination to idea and solution development	Make use of a process, model, or method to solve a quantitative or qualitative inquiry; assist students in determining where they went wrong while solving a problem
UNDERSTAND	Contextualize answers within emotional, moral, or ethical considerations; select relevant information; explain significance	Accurately describe a concept in different words; recognize a related example; translate to another language
REMEMBER	Recall information in situations where technology is not readily accessible	Retrieve factual information; list possible answers; define a term; construct a basic chronology or timeline

*AI capabilities derived with reference to an analysis of the MAGE framework, based on ChatGPT 4 as of October 2023. See Zaphir, L., Lodge, J. M., Liscio, J., McGrath, D., & Khosravi, H. (2024). How critically can an AI think? A framework for evaluating the quality of thinking of generative artificial intelligence. *arXiv preprint arXiv:2406.14769*.

In the Age of AI, it is
Human Intelligence
that we should
emphasize

The key is seeing
Artificial Intelligence
as a tool for
supplementing learning

Using Roles in GenerativeAI:

Role ⁶	Description	Example of implementation
Possibility engine	AI generates alternative ways of expressing an idea	Students write queries in ChatGPT and use the Regenerate response function to examine alternative responses.
Socratic opponent	AI acts as an opponent to develop and argument	Students enter prompts into ChatGPT following the structure of a conversation or debate. Teachers can ask students to use ChatGPT to prepare for discussions.
Collaboration coach	AI helps groups to research and solve problems together	Working in groups, students use ChatGPT to find out information to complete tasks and assignments.
Guide on the side	AI acts as a guide to navigate physical and conceptual spaces	Teachers use ChatGPT to generate content for classes/courses (e.g., discussion questions) and advice on how to support students in learning specific concepts.
Personal tutor	AI tutors each student and gives immediate feedback on progress	ChatGPT provides personalized feedback to students based on information provided by students or teachers (e.g., test scores).

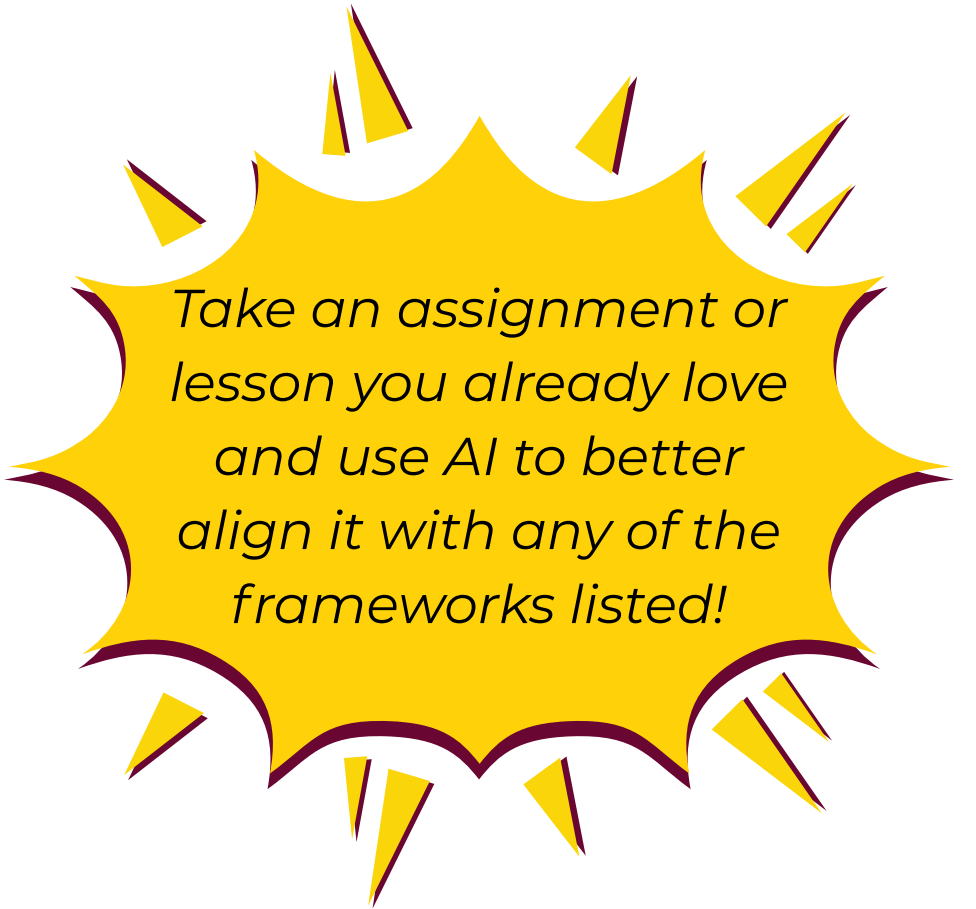
Consier UNESCO’s variety
of roles and types of
implementation for LLM’s

Co-designer	AI assists throughout the design process	Teachers ask ChatGPT for ideas about designing or updating a curriculum (e.g., rubrics for assessment) and/or focus on specific goals (e.g., how to make the curriculum more accessible).
Exploratorium	AI provides tools to play with, explore and interpret data	Teachers provide basic information to students who write different queries in ChatGPT to find out more. ChatGPT can be used to support language learning.
Study buddy	AI helps the student reflect on learning material	Students explain their current level of understanding to ChatGPT and ask for ways to help them study the material. ChatGPT could also be used to help students prepare for other tasks (e.g., job interviews).
Motivator	AI offers games and challenges to extend learning	Teachers or students ask ChatGPT for ideas about how to extend students’ learning after providing a summary of the current level of knowledge (e.g., quizzes, exercises).
Dynamic assessor	AI provides educators with a profile of each student’s current knowledge	Students interact with ChatGPT in a tutorial-type dialogue and then ask ChatGPT to produce a summary of their current state of knowledge to share with their teacher/for assessment.

Adapting Content Using AI!

- **Project-Based Learning (PBL):** An instructional approach where students engage in real-world, meaningful projects that require critical thinking, problem-solving, collaboration, and various forms of communication.
- **Culturally Responsive Teaching (CRT):** A pedagogy that recognizes the importance of including students' cultural references in all aspects of learning, aiming to make education more relevant and effective for diverse learners.
- **Social-Emotional Learning (SEL):** An approach that focuses on the development of self-awareness, self-control, interpersonal skills, and responsible decision-making, essential for success in school, work, and life.
- **Flipped Classroom:** A pedagogical model where the traditional lecture and homework elements are reversed. Students first explore new content at home, often via video, and then apply that knowledge in the classroom through interactive activities.
- **Inquiry-Based Learning:** A student-centered method of education that involves exploring questions, problems, or scenarios rather than presenting established facts or portraying a smooth path to knowledge.
- **Competency-Based Education (CBE):** An educational approach that focuses on students demonstrating mastery of skills and knowledge at their own pace, rather than progressing through courses based on time spent in class.
- **Critical Pedagogy:** A philosophy of education that encourages students to question and challenge domination, and the beliefs and practices that dominate, advocating for the development of critical consciousness.

Regardless of discipline one of AI's best use cases is adapting content to individual needs and learning styles.



Take an assignment or lesson you already love and use AI to better align it with any of the frameworks listed!

A.I in Education: Imagining Assignments 2.0

Language Arts

A teacher uses AI to recommend reading materials that reflect students' cultural backgrounds. The curated list features diverse authors, creating a more inclusive and engaging experience while encouraging personal connections to the texts.

History

Students explore industrialization by comparing AI-generated narratives from diverse global perspectives—like a factory worker in England, a farmer in India, and an artisan in China—broadening their understanding through cultural contrast.

Algebra

An AI tutor adapts problem sets in real time based on student progress. Struggling with a concept like quadratic equations triggers scaffolded hints, visuals, and group learning opportunities informed by performance data.

Psychology

Students examine AI-generated case studies of mental health scenarios, practicing diagnosis and evaluating ethical concerns. They compare their responses to the AI's, fostering critical thinking about therapeutic methods and AI's limitations.

Visual Arts

Students use AI tools like Midjourney or Adobe Firefly to generate poster designs inspired by movements like Art Deco or Afro-Futurism. They reflect on how visual styles convey cultural meaning and explain AI's role in their creative process.

Adapting to AI: From Product to Process

Learning Is a Recursive Process

Deep learning is recursive—it requires revisiting ideas, revising thinking, and adapting with feedback. AI tools can make this process more visible by offering immediate input, generating variations, and prompting iteration. The focus shifts from completing tasks to refining thought.

Why Process Matters

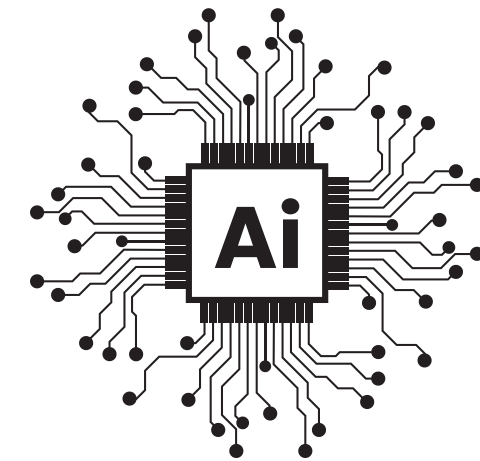
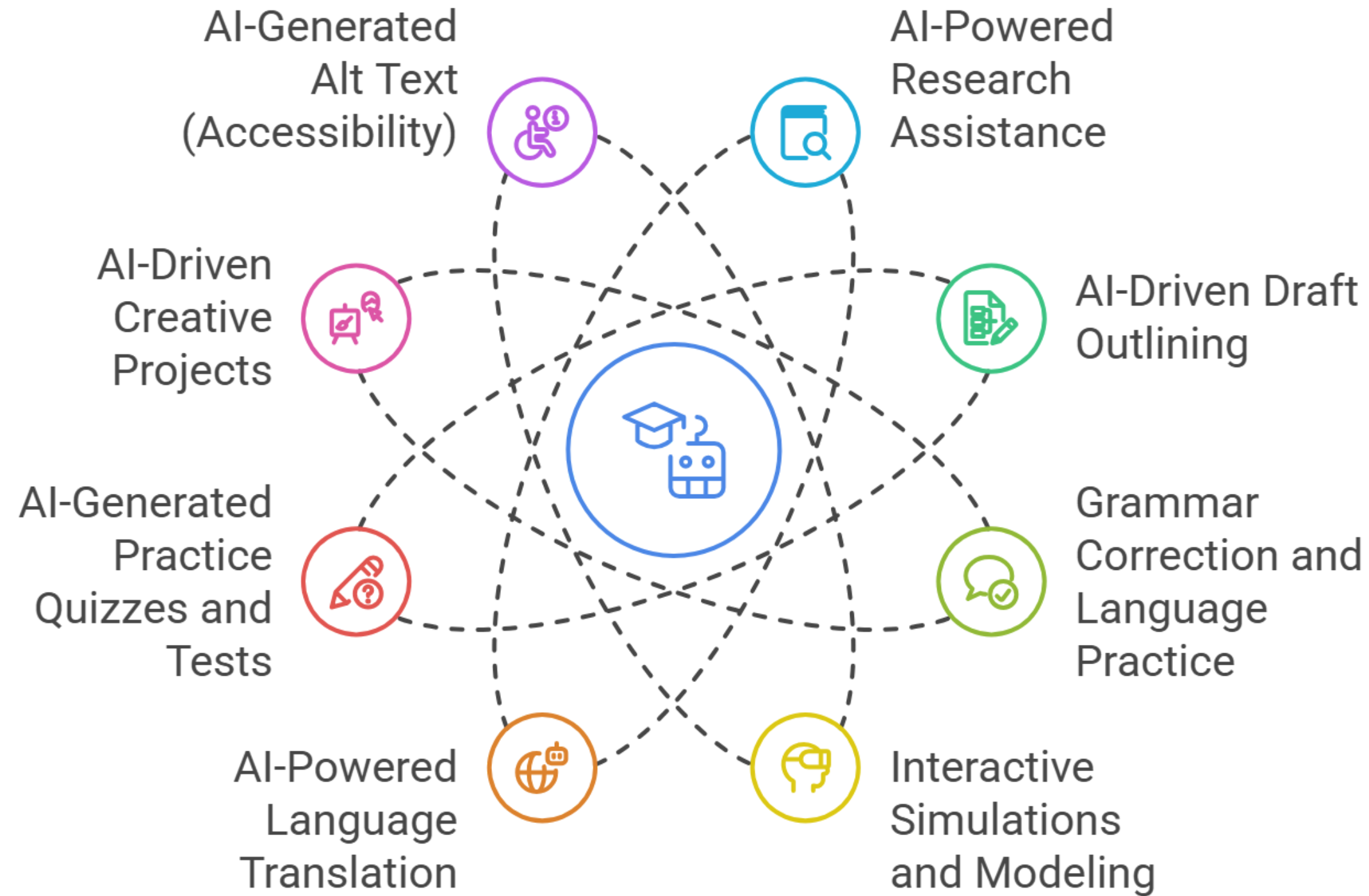
Prioritizing only polished work risks overlooking students' intellectual growth. Centering process values exploration, revision, and reflection. With AI, students can iterate ideas, test strategies, and build confidence in their thinking and decision-making.

Assessment Must Evolve

If learning is to remain authentic in the age of AI, assessment must also evolve. Grading could include the quality of engagement with tools—such as how well students prompted, revised, or reflected.

Assignments can ask for chat transcripts, prompt rationales, and annotations of AI input. These artifacts provide valuable insights into the student's decision-making and metacognitive development.

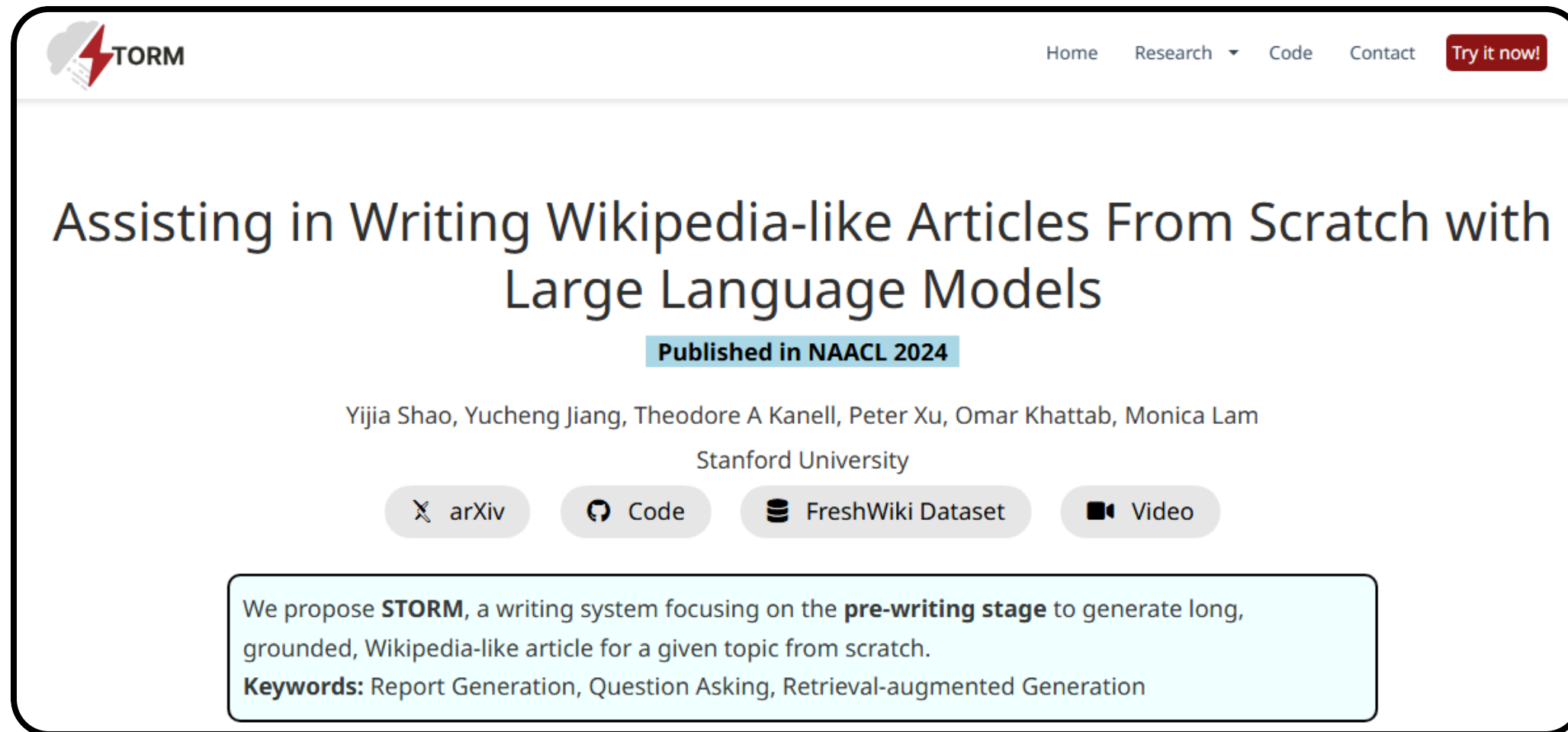
A.I in Education: Other Applications



These emerging tools are reshaping how we design instruction and support learners.

When used intentionally, they can offer scalable ways to personalize learning, foster engagement, and improve equity across disciplines.

A.I in Education: A.I for Research



<https://storm.genie.stanford.edu>

STORM is a tool from Stanford that helps users create Wikipedia-style articles from scratch using AI. It supports the pre-writing process by generating questions, retrieving relevant sources, and organizing content. Ideal for students starting research or exploring new topics.



Institutional Innovation and Effectiveness

A.I in Education: A.I Bots for Education

Gomez Syllabot

A syllabus bot for English 101 & 205 with Professor Gomez. Students can engage with the content of the syllabus and get to know more about the course at their liesure.

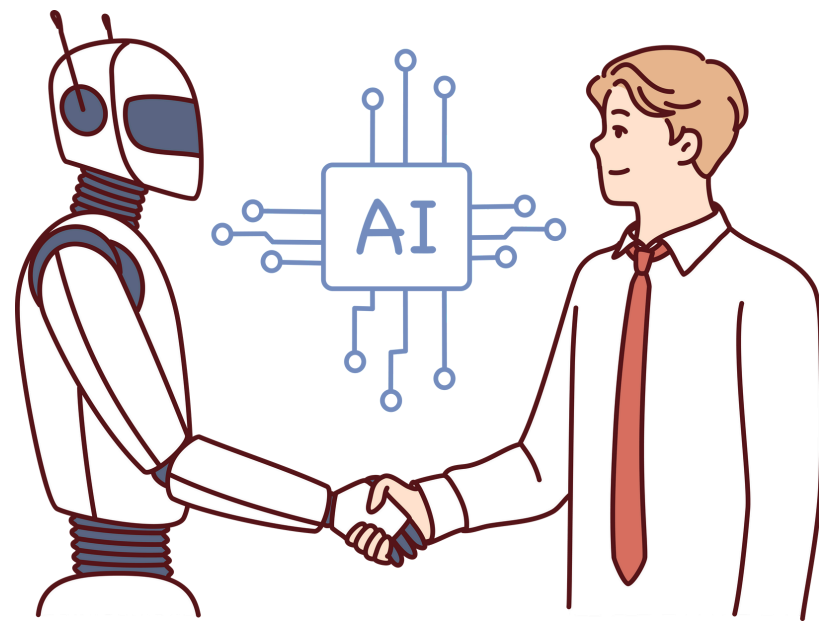
Start

The creators of this app can review your usage, never share personal information.
AI is not intended to give professional, legal, medical or financial advice.



AI bots can now be trained on course materials to deliver basic information, answer student questions, and support learning outside of class.

These **small**, custom-trained **models** help students engage with syllabi, assignments, and expectations on their own time.



A reminder as you consider AI:

AI Literacy involves an understanding of what generative AI is and what it is not; what it can do and what it cannot; what constitutes ethical and unethical use; and how to recognize AI outputs

AI is:

- Online and in-store shopping
- Robotic tractors, precision agriculture
- Warehouse Fulfillment
- Credit Card Fraud Protection
- Insurance Rates
- NASA images from space
- Text to Speech
- Foreign Language Translation
- Mapping and Navigation

It is in all of our lives and industries.

AI is NOT:

- Alive
- Smarter than us
- Killer robots
- Only for geniuses
- Only for people in tech cities
- Always physical. It is inside our computer software and phone apps.

And it is not going away.

<https://www.teachai.org/toolkit>

Conclusion & Takeaways

AI should be used responsibly and ethically

AI should enhance human capabilities, not replace them. Responsible use means addressing concerns around privacy, transparency, and fairness.

AI can be a powerful tool for improving outcomes & efficiency

AI can automate repetitive tasks, offer real-time insights, and support creative processes—helping individuals and organizations achieve more, faster.

AI can become a powerful tool for equity

With equitable access, AI can empower underrepresented groups by providing new opportunities and leveling the playing field in education, business, and beyond.



THANK YOU!

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SAN DIEGO
MIRAMAR
COLLEGE

SAN DIEGO
CITY COLLEGE

SAN DIEGO COLLEGE OF
CONTINUING EDUCATION



**Hope you found our
time productive!**

Stay in touch!

rgomez001@sdccd.edu

Institutional Innovation and Effectiveness



SURVEY

**Please remember to fill out
our survey. It helps us make
sure we're offering you
valuable support!**

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