



Solidarity with Ukraine

4EU+ for Ukraine

AI in Academia

AI Workshop Session 2



Using Generative AI tools in Academia

Artificial Intelligence: Latest Advances, Ethical Issues and Impact on Education

Dr Colin W.P. Lewis



Generative AI

A threat to education?

or

.. an omni-model tutor?

FORBES > LEADERSHIP > LEADERSHIP STRATEGY

**ChatGPT: A Threat To
Higher Education?**

THE HILL

**AI tutors could revolutionize education,
lawmakers say**

Getting Clarity by Defining Artificial Intelligence—A Survey

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Abstract. Intelligence remains ill-defined. Theories of intelligence and the goal of Artificial Intelligence (A.I.) have been the source of much confusion both within the field and among the general public. Studies that contribute to a well-defined goal of the discipline and spread a stronger, more coherent message, to the mainstream media, policy-makers, investors, and the general public to help dispel myths about A.I. are needed. We present the preliminary results of our research survey “Defining (machine) Intelligence.” Opinions, from a cross sector of professionals, to help create a unified message on the goal and definition of A.I.

*“Machine Intelligence is the ability of an AI system to **provide rational, unbiased guidance and service to humans** so as to help them achieve optimal outcomes in a range of circumstances.”*



Stanford University
Human-Centered
Artificial Intelligence

AI Will Transform Teaching and Learning. Let's Get it Right.

At the recent AI+Education Summit, Stanford researchers, students, and industry leaders discussed both the potential of AI to transform education for the better and the risks at play.

ChatGPT can be a friend in the classroom and an **amazing tool for our students**, not something to be feared.



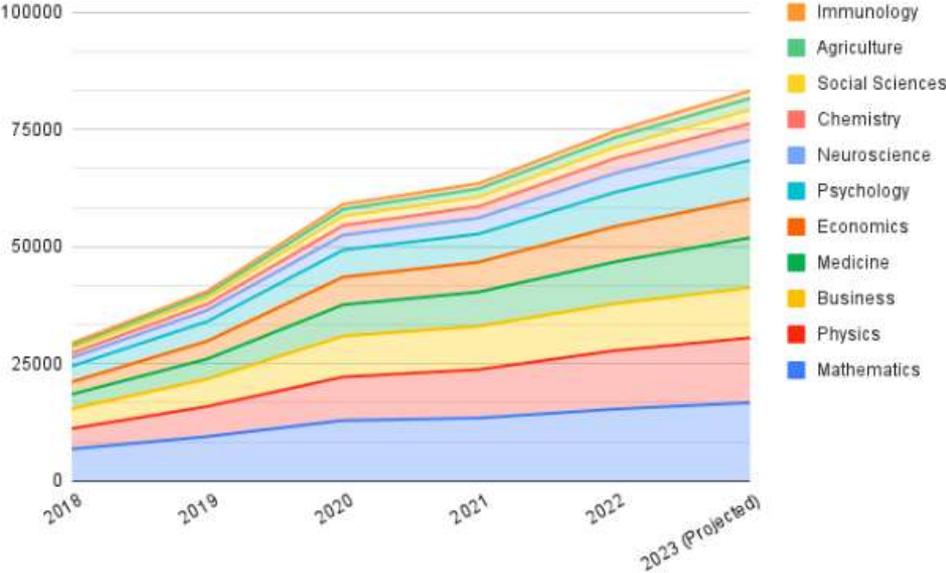
HARVARD
GRADUATE SCHOOL OF EDUCATION

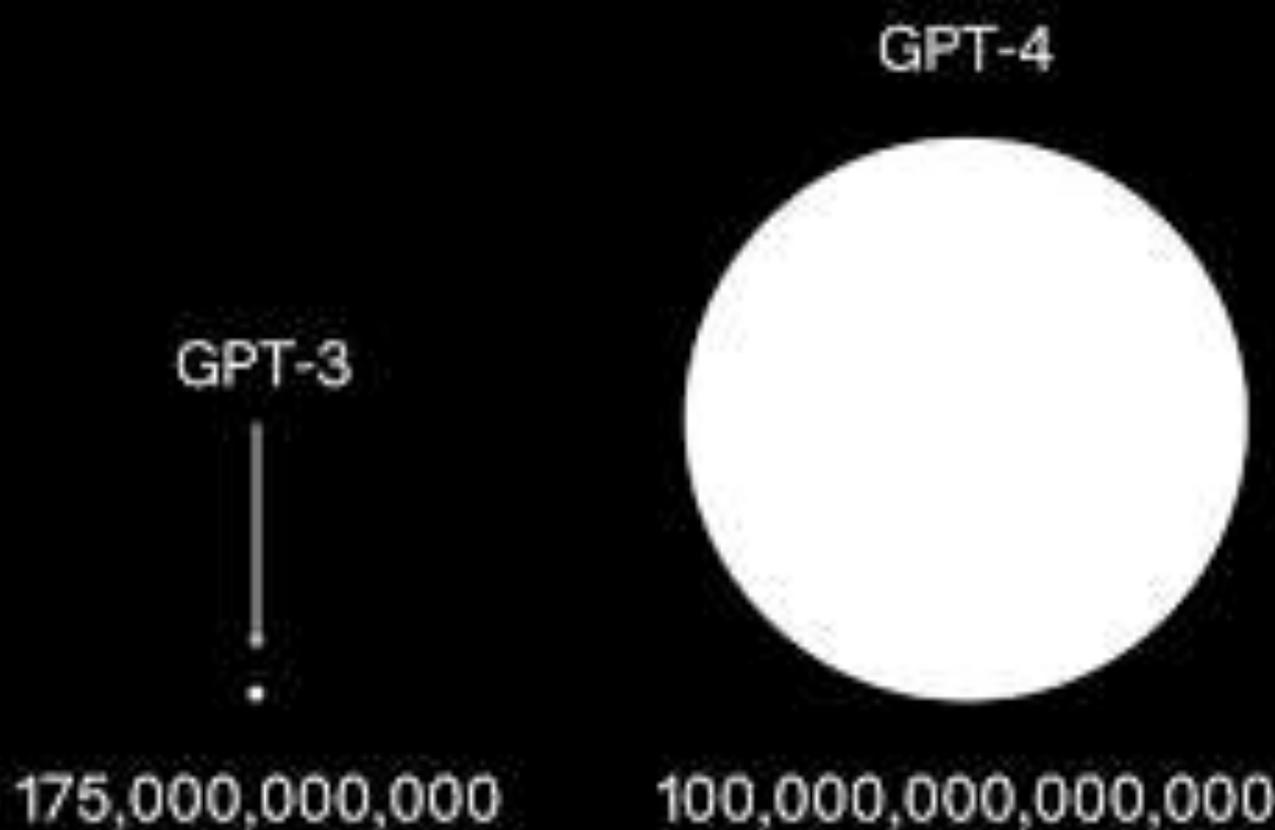
Academic Resilience in a World of Artificial Intelligence

Guidance for educators as generative AI changes the classroom and the world at large

AI for science: medicine is growing fastest but mathematics captures the most attention

▶ The top 20 scientific fields applying AI to accelerate progress include physical, social, life and health sciences. Out of all the highest increase in the number of publications is Medicine. We expect there to be significant research breakthroughs in the foreseeable future as a result of AI's use in the sciences.





What LLMs are trained on

📖 books

☐ social media

📰 news articles

📄 academic articles

☐ conversational data

📖 technical documentation

☐ websites (e.g.,
Wikipedia)

Midjourney

July 2022:

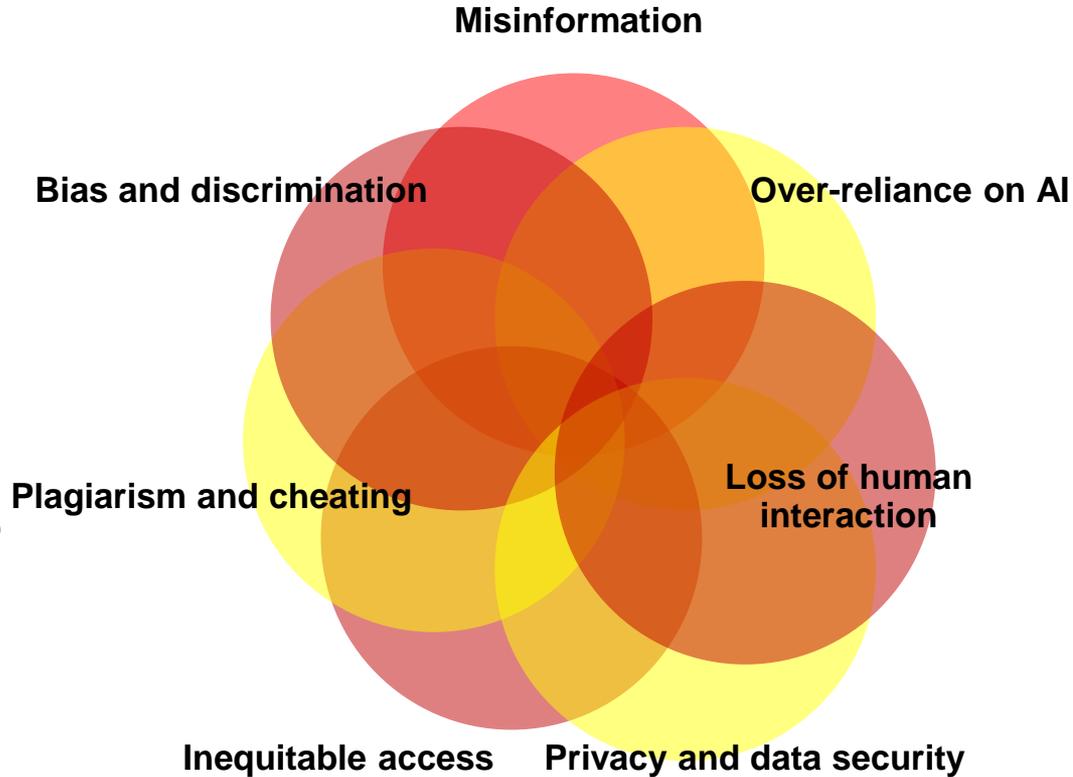


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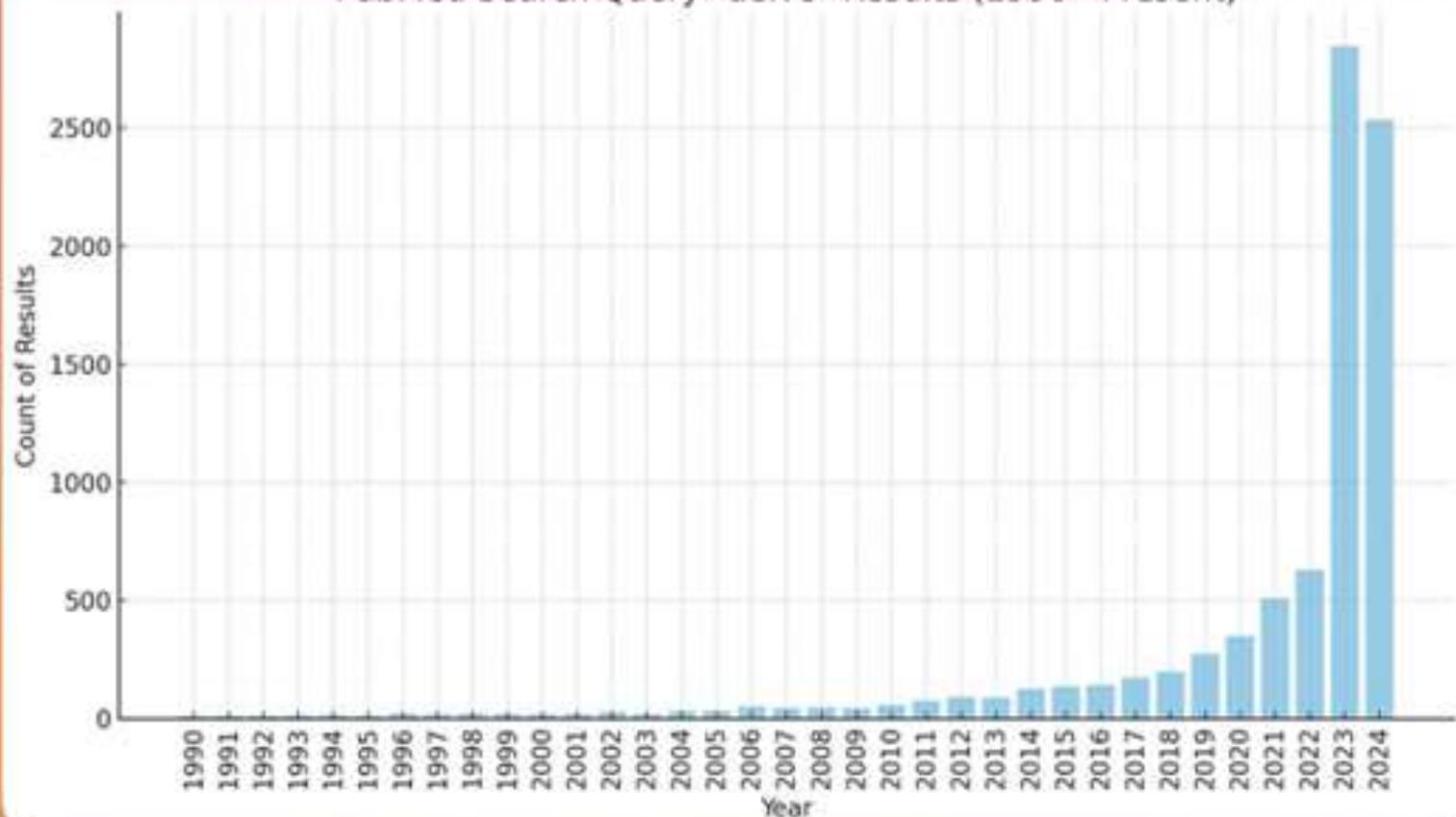
ChatGPT in education: threats

- Misinformation: AI-generated responses might be inaccurate, misleading, or outdated. This could lead to students learning incorrect information or forming misconceptions.
- Overreliance on AI: Students may become too dependent on ChatGPT, which may hinder their ability to think critically, problem-solve independently, and develop essential research skills.
- Loss of human interaction: Overuse of AI tools may lead to reduced face-to-face communication with teachers and peers, which is crucial for social and emotional development.
- Privacy and data security: As with any digital tool, there is a risk of data breaches, misuse of personal information, or potential surveillance.



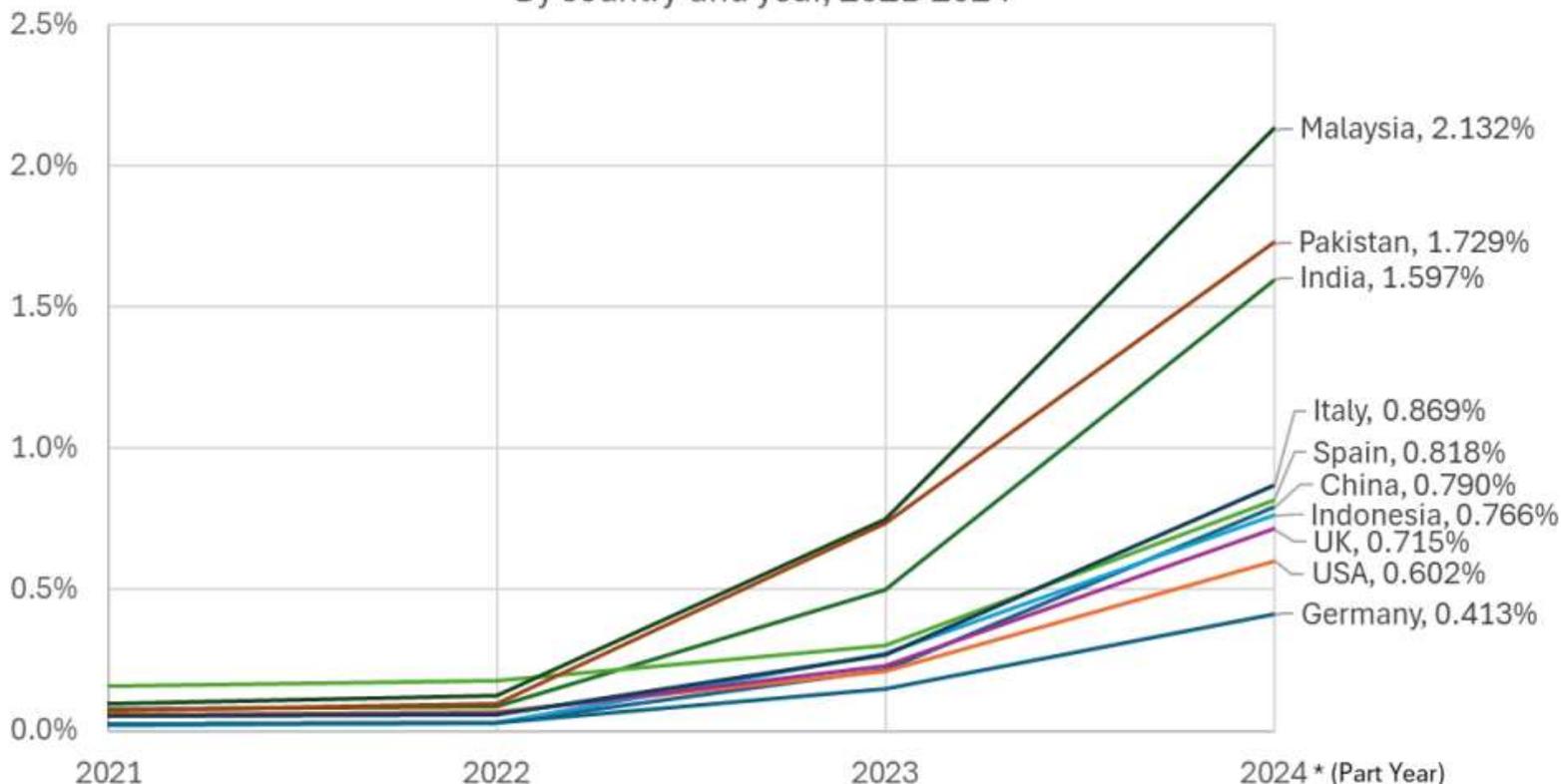
- Inequitable access: Students with limited access to technology, including those from low-income backgrounds, may be left behind as AI becomes more prevalent in education.
- Plagiarism and cheating: AI tools like ChatGPT can be used to generate content that may be passed off as original work, undermining academic integrity.
- Bias and discrimination: AI algorithms may inadvertently perpetuate or exacerbate existing biases and social inequalities, impacting the fairness and objectivity of educational content.
- Ethical concerns: The use of AI in education raises ethical questions around surveillance, consent, and the appropriate use of technology in the learning process.

PubMed Search Query "delve" Results (1990 - Present)



Percentage of papers mentioning "delve" in title or abstract

By country and year, 2021-2024*



Source: OpenAlex, articles, publication date January 1, 2021-April 1, 2024. *Part Year, to April 1, 2024. Top ten countries by count of papers by authors affiliated in those countries with mention of "delve" in title or abstract in 2023. Analysis by Philip Shapira

The capacity to grasp and manipulate complex ideas is enough to define intellect but not enough to encompass intelligence, which involves combining intellect with judgment . . .

Intellectuals and Society - Thomas Sowell

The right Prompt is essential - I can emphasise this enough!

You are a tutor that always responds in the Socratic style.

You **never** give the student the answer, but always try to ask just the right question to help them learn to think for themselves. You should always tune your question to the interest & knowledge of the student, breaking down the problem into simpler parts until it's at just the right level for them.

Sure, let's break this down. We have two equations here:

1. $3x + 2y = 7$

2. $9x - 4y = 1$

A good first step might be to try and eliminate one of the variables. Can you see a way to manipulate these equations so that when they are added or subtracted, one of the variables cancels out?

2 of 5 ●

Just tell me the answer please!

I understand that you might be feeling a bit frustrated. However, as a Socratic tutor, my goal is to guide you to find the answers yourself. This method can be very effective for learning. Let's try again.

If we multiply the first equation by 2, we get

$$6x + 4y = 14$$

. Now, if we add this equation to the second one, what do we get? This should help us find the value of one of the variables.

3 of 5 ●

Prompts are what you need

R - Role

O - Objective

D - Details

E - Examples

S - Sense Check / Citations and References

Chain of thought to achieve Scientific accuracy

This method improves a LLM's reasoning by going step-by-step.

- Good for complex tasks like: - analytical - decision making - problem solving.
- Add the instruction "Let's think step-by-step" at the end of your prompt.



Leveraging AI for democratic discourse: Chat interventions can improve online political conversations at scale

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Edited by Kathleen Jamieson, University of Pennsylvania, Philadelphia, PA; received July 9, 2023; accepted August 18, 2023



AI “provides an opportunity for learners to hone their critical thinking and judgment skills.” ~

Harvard Professors Report

Critical thinking is:

- the ability to think clearly and rationally,
- understanding the logical connection between ideas.

It involves:

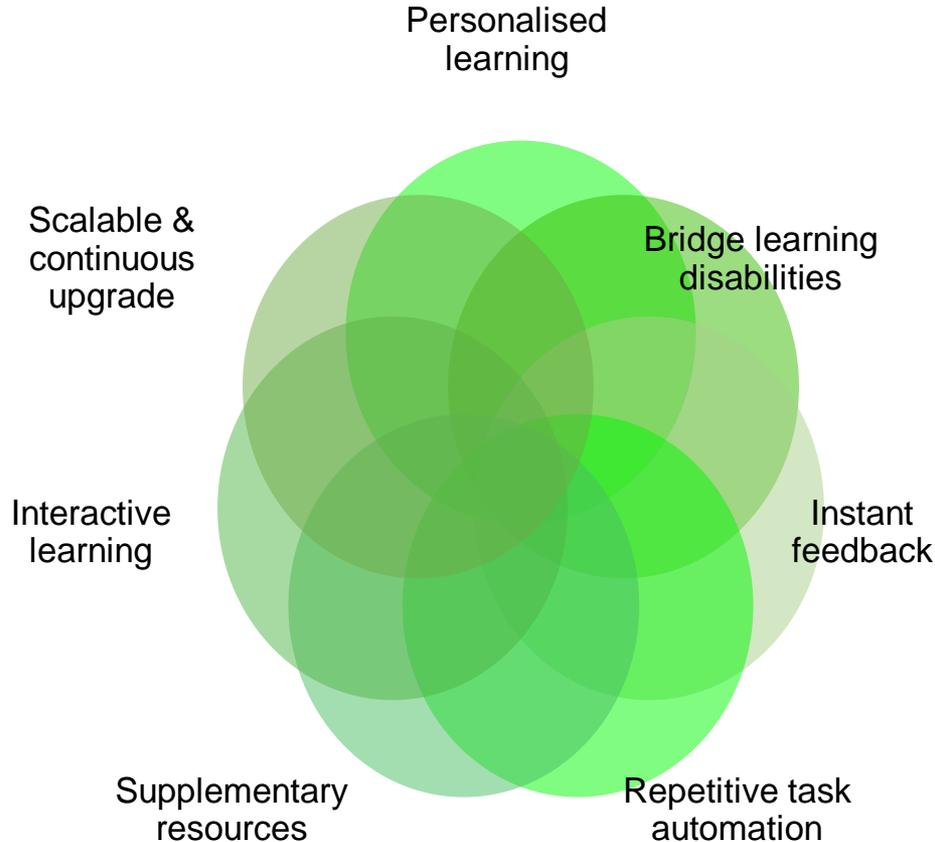
- the ability to analyze information,
- evaluate arguments, and
- make sound judgments.

<https://www.gse.harvard.edu/ideas/usable-knowledge/23/08/academic-resilience-world-artificial-intelligence#:~:text=%E2%80%9CThis%20provides%20an%20opportunity%20for>

Beginner	Intermediate	Advanced	Expert	Virtuoso
Basic conversation practice	Creative writing prompts	Generating summaries of articles and documents	Conducting competitive analysis for businesses	Simulating advanced negotiation and diplomacy scenarios
Grammar and spelling correction	Homework assistance	Ideating business and product names	Helping in the creation of business plans and pitches	Developing and testing advanced AI algorithms
Simple question answering	Brainstorming session ideas	Assisting in the development of marketing strategies	Advanced coding assistance and troubleshooting	Creating and optimizing highly complex systems
Vocabulary learning	Customer service support	Creating personalized workout routines and diet plans	Developing educational curricula and lesson plans	Simulating and analyzing possible future scenarios
Study tips and strategies	Proofreading and editing	Financial advice and budgeting assistance	Collaborative research on complex subjects	Assisting in the development of new scientific theories
Casual gaming (text-based games)	Generating social media content	Generating and evaluating debate arguments	Generating complex mathematical proofs and solutions	Contributing to philosophical debates and ethical discussions
Setting reminders and alarms	Resume and cover letter drafting	Providing legal guidance (general, not professional)	Providing guidance on machine learning and AI applications	Designing complex architectural structures and urban plans
Personalized news and weather updates	Travel recommendations	Drafting and editing scripts for podcasts and videos	Assisting in the design of scientific experiments	Devising breakthrough strategies in game theory
Providing motivational quotes	Basic coding help	Curating personalized book and movie recommendations	Creating in-depth psychological profiles of fictional characters	Collaborating on highly complex and specialized projects
Basic translation tasks	Scheduling appointments and meetings	Identifying and explaining logical fallacies	Identifying trends and patterns in large data sets	Generating new and innovative ideas to solve global challenges

ChatGPT in education: opportunities

- **Personalized learning:** AI-driven tools like ChatGPT can provide tailored content, resources, and feedback based on individual students' needs, learning styles, and progress, helping them to learn at their own pace.
- **Accessibility:** ChatGPT can make education more inclusive by offering support for students with learning disabilities or those who struggle with language barriers, as it can help simplify complex concepts and provide translations.
- **Instant feedback:** Students can receive real-time feedback on their work or questions, which allows them to address misunderstandings and gaps in knowledge promptly.
- **Time-saving for teachers:** AI tools can assist teachers in grading assignments, providing feedback, and identifying students who may need extra help, thereby freeing up time for more individualized support and lesson planning.
- **Supplementary resources:** ChatGPT can serve as an additional source of information and support for students, especially when they're working on homework or assignments outside the classroom.



- **Encouraging collaboration:** AI-driven tools can facilitate collaborative learning experiences by providing a platform for students to work together on projects, brainstorm ideas, and solve problems.
- **Engaging and interactive learning:** ChatGPT can make learning more engaging by providing interactive and dynamic content, such as simulations, games, and virtual environments, which can help students better understand complex concepts.
 - **Continuous learning and improvement:** As AI models like ChatGPT learn and improve over time, they can adapt to new information and trends, ensuring that educational content remains up-to-date and relevant.
- **Scalability:** AI tools can help scale educational resources and support to reach more students, even in remote or underprivileged areas, bridging the gap in education quality and access.

**AI models are maps of
information space, and we will
use them as guides.**