

Advancing Earth Science Education through Generative Artificial Intelligence

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Traditional Search Engines

Google

 Bing



YAHOO!



Task 1:

Water balance equation and its components in a watershed system

Using traditional search engines

Steps:

- Open Google or Bing.
- Type in "Water balance equation components in hydrology."
- Browse the list of results and select relevant links.
- Skim through articles, research papers, and textbook explanations.
- Manually compile and synthesize information from various sources.

Time Estimate:

•

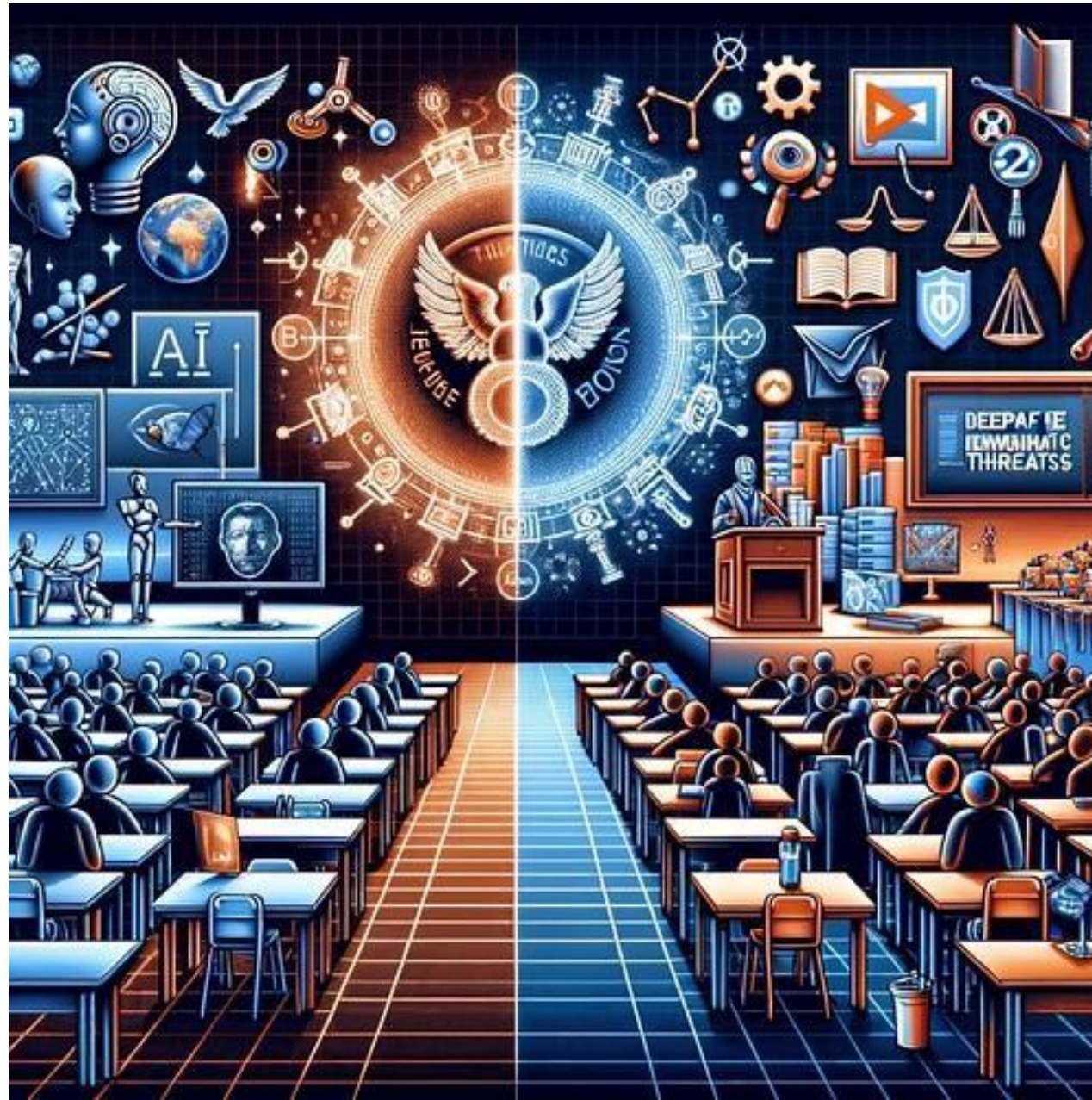
Features:

- Information is spread across different sources.
- Requires evaluating the credibility of each link.
- Time-consuming.

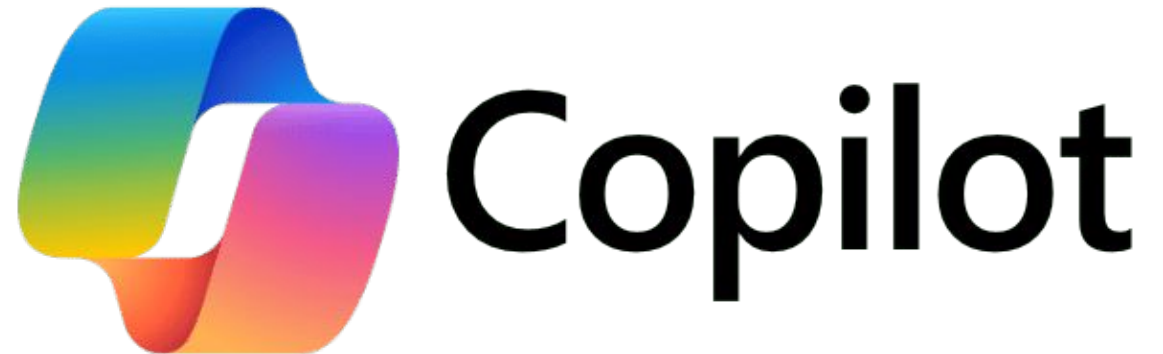
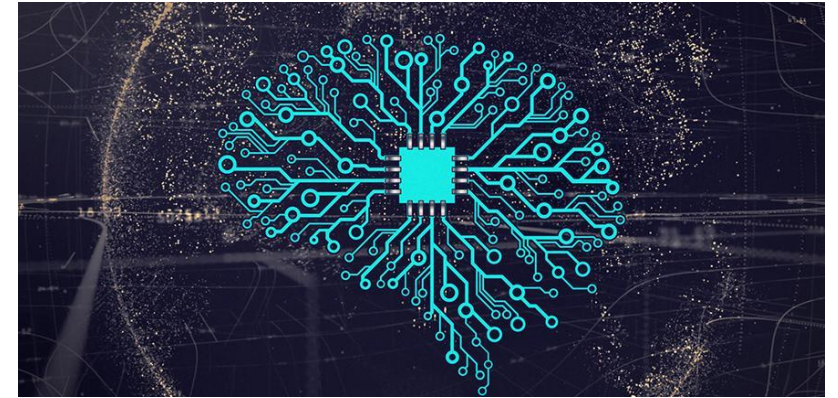
Multiple Choice Questions



Welcome to the Future of Learning!



Language Learning Models (LLMs)



Unleashing the Full Power of AI Tools



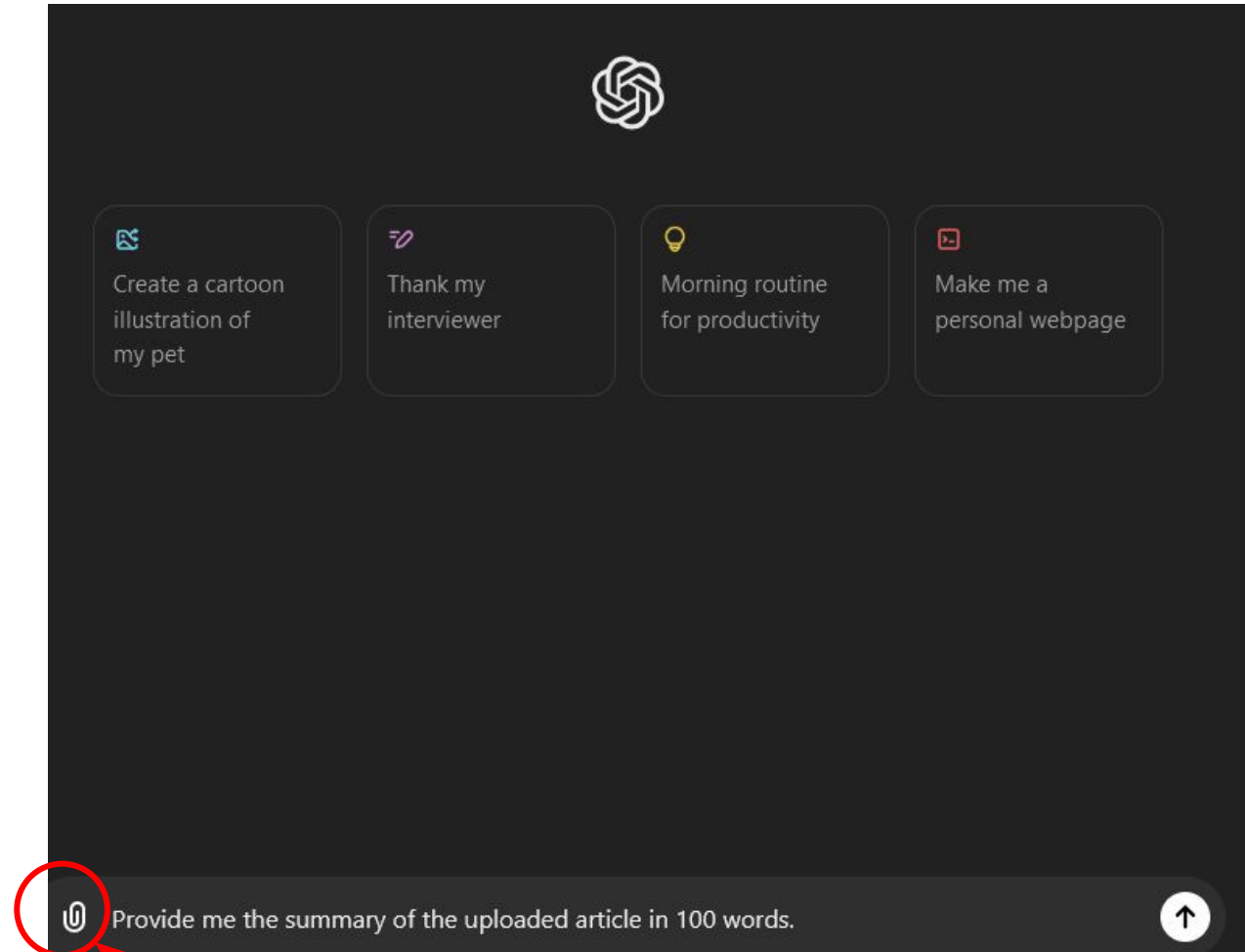
1. Understanding Complex Materials from PDFs or Books

Entire Books at Your Fingertips

Upload a full textbook or PDF and ask detailed questions about its content- no need to flip through pages.

Targeted Learning

Ask for summaries of specific sections or explanations of concepts in simpler terms.



Attach file here

2. Data Analysis

Data Processing

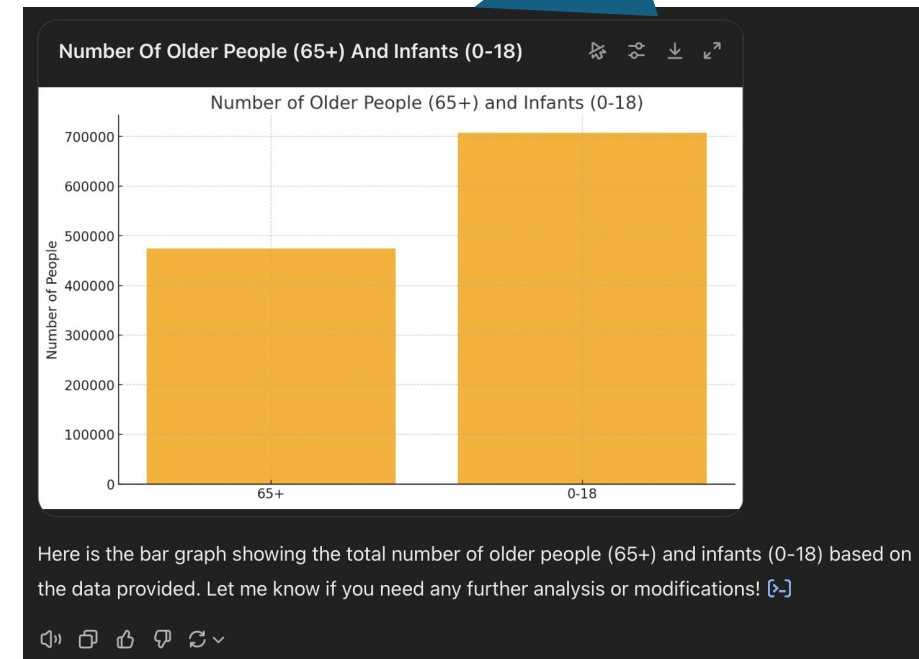
You can upload CSV files, Excel sheets, or datasets directly into AI models like ChatGPT for analysis

Instant Insights

Get immediate summaries, statistical analysis, and visualizations without needing advanced coding skills.

Vulnerable Age			
	COUNTY	65+	0-18
1	Adams	5811	6645
2	Alcorn	6814	8569
3	Amite	2895	2532
4	Attala	3539	4617
5	Benton	1489	1747
6	Bolivar	4876	7733

Can you read this csv and show the bar graph depicting number of older age people and infants?



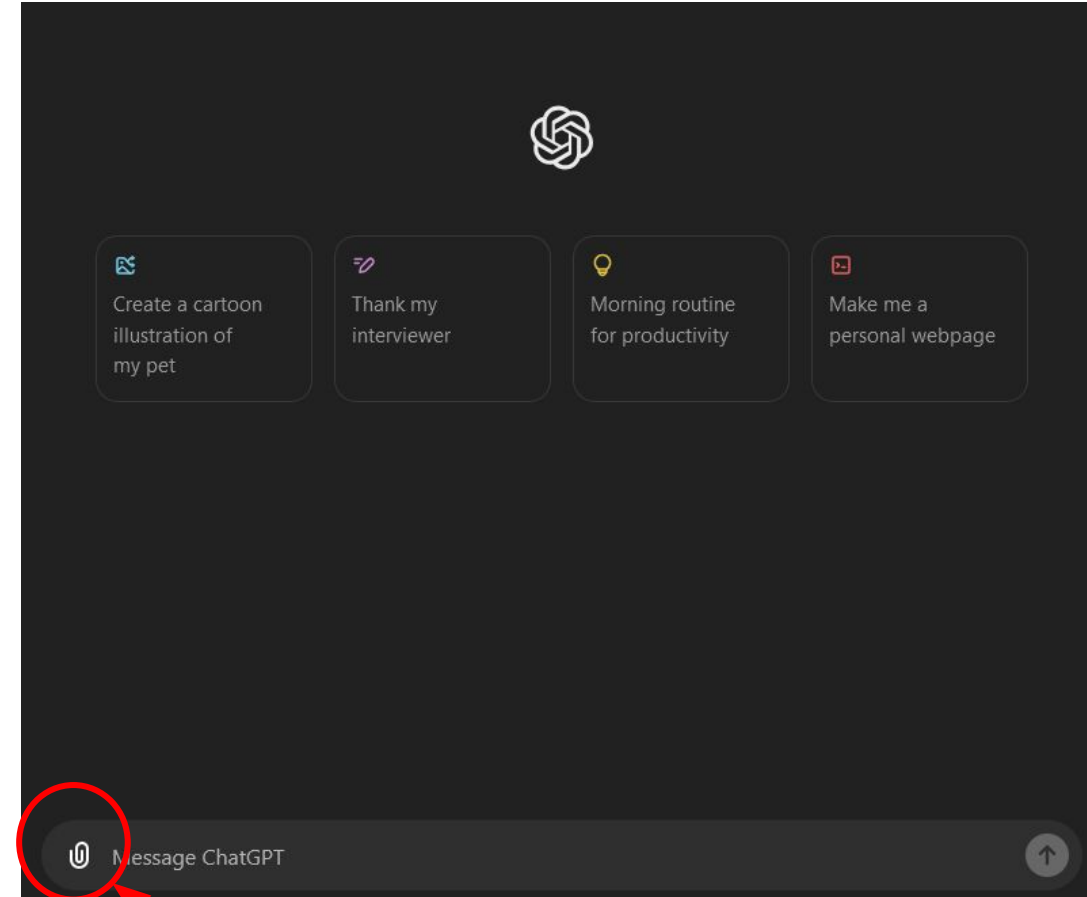
3. Clarify Class Presentations

Upload Presentations

You can upload your class PowerPoints, and AI can help you break down complex slides, summarize key points, or even explain topics in more digestible formats.

Study Aid

Revisit the most challenging parts of your lectures with detailed, simplified explanations.



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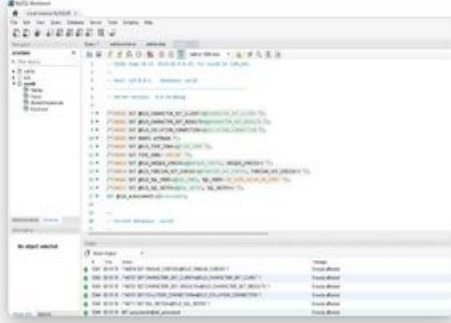
4. Simplifying the Complex

Explain Like I'm 10 years old


Struggling with a tough concept like Einstein's equations? Simply ask, "Explain like I'm 10 years old," and receive an easy-to-understand version of even the most advanced topics.

You

Can you describe me this as like I am 10 years old?



questions



answers

Copilot

✓ Analyzing the image: Privacy blur hides faces from Copilot

Sure! Imagine you have a big toy box where you keep all your favorite toys. Now, let's say you want to find your favorite action figure quickly. You'd need to organize your toy box so you know exactly where everything is, right?

The picture you showed me is like a special computer program that helps people organize and find information in a big digital toy box called a database. This program is called **MySQL Workbench**.

5. Programming Language

No Coding Skills? No Problem

AI tools can help you write, debug, and understand code even if you have little or no prior programming experience.

Real-Time Assistance

Whether it's Python, Java, or C++, simply describe your task, and the AI will help generate and explain code step by step.

Blackbox

Generate a code to plot x and y values in scatter plot with proper axis name and title

Here is an example code in Python using the popular `matplotlib` library to generate a scatter plot with proper axis names and title:

```
1 import matplotlib.pyplot as plt
2
3 # Sample data
4 x = [1, 2, 3, 4, 5]
5 y = [2, 4, 6, 8, 10]
6
7 # Create the figure and axis
8 fig, ax = plt.subplots()
9
10 # Plot the scatter plot
11 ax.scatter(x, y)
12
13 # Set the axis labels and title
14 ax.set_xlabel('X Axis')
15 ax.set_ylabel('Y Axis')
16 ax.set_title('Scatter Plot of X and Y Values')
17
18 # Show the plot
19 plt.show()
```


6. Ethical Considerations



Task 2:

Water balance equation and its components in a watershed system

Using AI Models (ChatGPT, Claude, etc.)

Steps:

- Open an AI model like ChatGPT or Claude.
- Enter the question: "Explain the water balance equation and its components in a watershed system."
- Instantly receive a complete, structured response in plain language.

Efficiency:

- Minimize time and efforts

Features:

- Fast and easy-to-understand response.
- Well-structured, context-aware explanation.
- Ability to ask follow-up questions for further clarification.

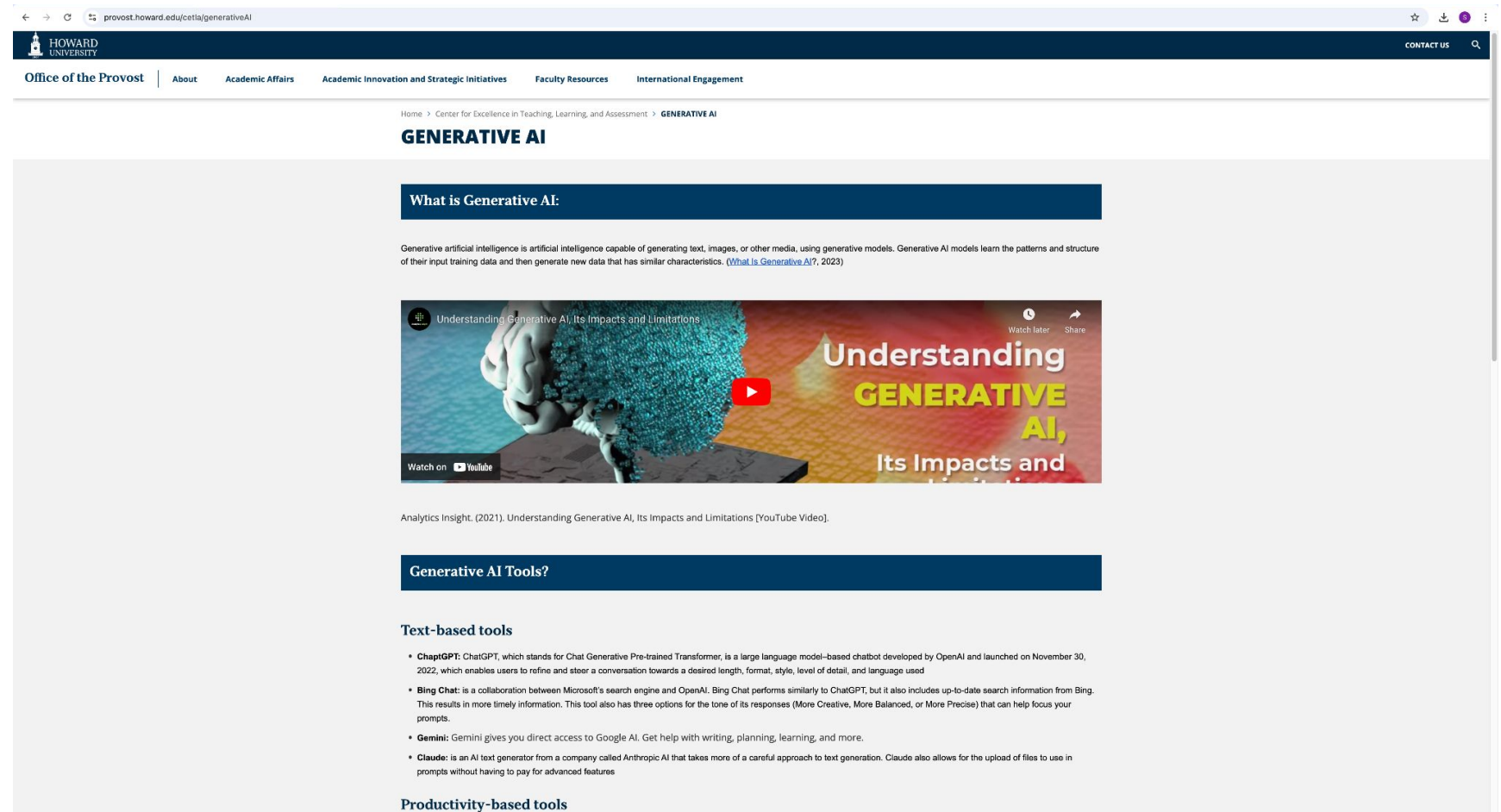
Multiple Choice Questions



Read more about Generative AI

<https://provost.howard.edu/initial-howard-university-guidelines-use-generative-ai-tools>

<https://provost.howard.edu/cetla/generativeAI>



The screenshot shows a web browser displaying the Howard University Provost's Office website. The page is titled "Generative AI" and is part of a series of pages under the "Center for Excellence in Teaching, Learning, and Assessment". The page content includes a section titled "What is Generative AI:" which defines generative artificial intelligence as AI capable of generating text, images, or other media using generative models. Below this is a video player for a YouTube video titled "Understanding Generative AI, Its Impacts and Limitations". The video player shows a thumbnail with a brain and the text "Understanding GENERATIVE AI, Its Impacts and Limitations". Below the video player is a caption: "Analytics Insight. (2021). Understanding Generative AI, Its Impacts and Limitations [YouTube Video].". The page also includes a section titled "Generative AI Tools?" which lists several tools: "ChaptGPT", "Bing Chat", "Gemini", and "Claude". Each tool is described with its capabilities and how it can be used.

Howard University
Office of the Provost | About | Academic Affairs | Academic Innovation and Strategic Initiatives | Faculty Resources | International Engagement

Home > Center for Excellence in Teaching, Learning, and Assessment > **GENERATIVE AI**

GENERATIVE AI

What is Generative AI:

Generative artificial intelligence is artificial intelligence capable of generating text, images, or other media, using generative models. Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics. ([What Is Generative AI?](#), 2023)

Understanding Generative AI, Its Impacts and Limitations

Watch on YouTube

Analytics Insight. (2021). Understanding Generative AI, Its Impacts and Limitations [YouTube Video].

Generative AI Tools?

Text-based tools

- **ChaptGPT:** ChatGPT, which stands for Chat Generative Pre-trained Transformer, is a large language model-based chatbot developed by OpenAI and launched on November 30, 2022, which enables users to refine and steer a conversation towards a desired length, format, style, level of detail, and language used
- **Bing Chat:** is a collaboration between Microsoft's search engine and OpenAI. Bing Chat performs similarly to ChatGPT, but it also includes up-to-date search information from Bing. This results in more timely information. This tool also has three options for the tone of its responses (More Creative, More Balanced, or More Precise) that can help focus your prompts.
- **Gemini:** Gemini gives you direct access to Google AI. Get help with writing, planning, learning, and more.
- **Claude:** is an AI text generator from a company called Anthropic AI that takes more of a careful approach to text generation. Claude also allows for the upload of files to use in prompts without having to pay for advanced features

Productivity-based tools

Outcomes

