CQSD
CENTRE FOR QUALITY SUPPORT & DEVELOPMENT

University of Reading

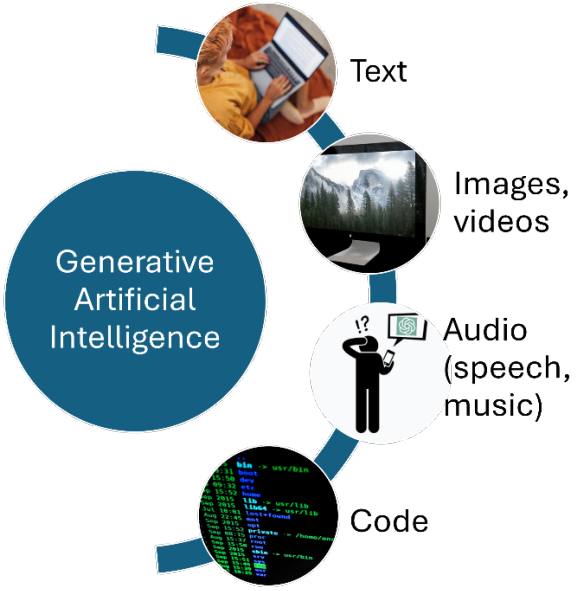
FOCUS ON: GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS

GETTING STARTED WITH GENAI

V 1.5 (DECEMBER 2024)

WHAT IS GENERATIVE ARTIFICIAL INTELLIGENCE?

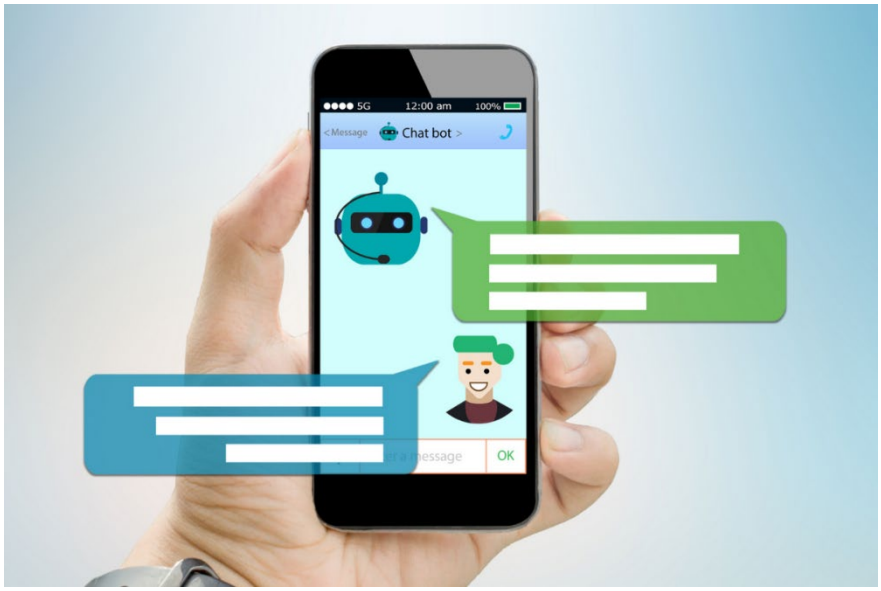
Artificial intelligence (AI) is transforming the way we approach problem-solving and decision-making, with IBM (2023) defining it as the use of computers and machines to mimic human cognitive abilities. A key subfield of AI is Machine Learning (ML), which enables systems to learn from data without explicit programming. When ML intersects with other AI areas like Natural Language Processing, Computer Vision, and Speech Recognition, we get Generative AI — technology capable of generating *new content* in the form of text, code, images, speech, music and even video.



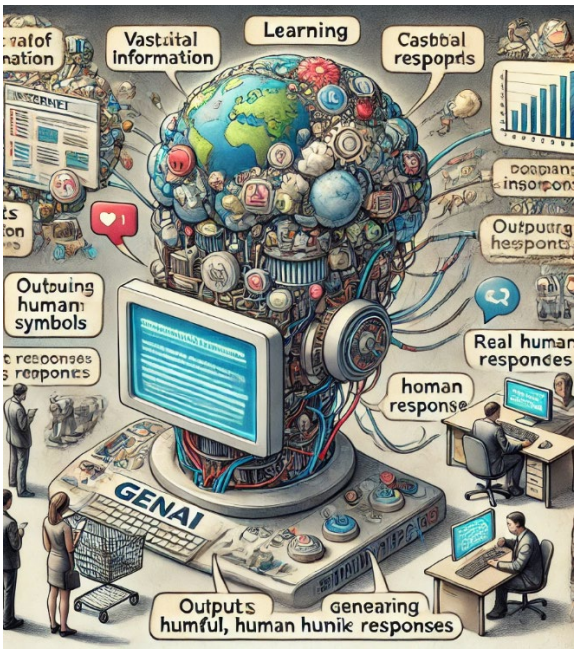
As we approach the second anniversary of Generative AI (GenAI) tools like ChatGPT being launched, three important insights have emerged from our experience with AI so far. First, it is a powerful tool that, whilst can be a 'force for good', can also cause harm if misused. Secondly, it often brings to light existing challenges within our systems and society; and, finally, it must remain under careful human oversight. AI is driven by the data we provide and our interactions with it, and it relies on us to guide its use responsibly. In the realm of education, GenAI offers significant potential to support teaching and learning, but it requires careful stewardship to harness its benefits effectively.

GENAI AS NARROW AI

GenAI tools like ChatGPT are examples of Narrow AI. These systems are termed "narrow" because they are designed to function within specific knowledge domains and have a limited scope. Unlike human intelligence, which can apply knowledge across a wide range of areas, narrow AIs are constrained to perform tasks in defined fields. Classic examples of Narrow AI include chatbots and voice-activated assistants like Alexa and Siri, which typically rely on predefined scripts or rules to generate responses to user inputs, making them functional but somewhat rigid.



However, GenAI (such as ChatGPT) takes Narrow AI to a whole new level. While still narrow in the sense that they operate within the domains of language and communication, these tools are much more sophisticated than typical chatbots. GenAI doesn't rely on fixed scripts but instead learns from vast datasets, often scraped from the internet, using advanced machine learning techniques like Natural Language Processing (NLP). Tools like ChatGPT generate human-like responses by predicting the next likely word in a sequence, allowing them to create new content that feels dynamic rather than simply repeating predetermined outputs.



This strange and intriguing image was generated by DALL-e3, an image-based GenAI, based on the concepts described in the paragraph above.

That said, GenAI tools are not infallible and can sometimes "hallucinate," or generate incorrect information. This happens because they incorporate a degree of randomness, or stochastic-ness, particularly when responding to prompts they haven't encountered before. This randomness helps them handle new inputs, but it can also lead to errors, earning them the nickname "stochastic parrots." They essentially repeat what they've been trained on, adding a layer of randomness to bridge gaps in their knowledge. While this vulnerability can result in mistakes, it also offers opportunities to help improve AI literacy and in the development of evaluative judgment.

POPULAR GENAI TOOLS (OCT 2024)

The most common GenAI tools at the time of writing are:

- ChatGPT (made by OpenAI)
- Copilot (Microsoft's version of ChatGPT, built into its search engine Bing, Windows 10 / 11, Edge sidebar and tailored to Office 365 applications)
- Claude (made by Anthropic)
- Mixtral (made by Mistral AI)
- Llama (made by Meta)
- Gemini (made by Google DeepMind)
- ERNIE Bot (China's answer to ChatGPT made by Baidu)

Please note that this list is not exhaustive. Please refer to the article here which frequently updates its list of well-known GenAI tools:
https://bit.ly/GenAI_list

Some popular GenAI tools specialising in image creation include Midjourney, Stable Diffusion 2.1 (StabilityAI) and DALL-e3 (OpenAI).

THE GENAI PIONEER: CHATGPT

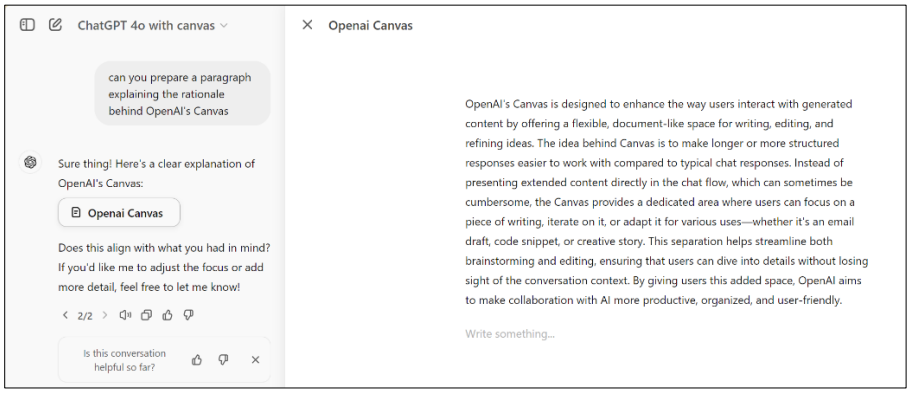
ChatGPT, which stands for "Chat Generative Pre-trained Transformer," was developed by OpenAI, a San Francisco-based company founded in 2015. OpenAI released the original GPT in June 2018, and it was groundbreaking for its ability to generate coherent, contextually relevant text based on user prompts. Building on this success, OpenAI introduced subsequent versions, each offering improvements in scale, capability, and performance. By late 2022, ChatGPT-3.5 had taken the world by storm, gaining 1 million users

within just five days of its launch in November 2022. Currently, ChatGPT is now up to version ChatGPT-4 (for free access), and has approximately 180.5 million users.

ChatGPT Plus is available as a subscription-only service (of approximately £16 - £18 per month), while ChatGPT-4 is free to use. At the Plus level, users gain access to most of ChatGPT's latest features and more advanced models such as ChatGPT4o, ChatGPT 4o with Canvas, o1 etc. Plus subscribers also face fewer rate limits (the number of times you can interact with ChatGPT in a given time) compared to free users. Sometimes, OpenAI allows users on the free model to trial more advanced models but when this happens is quite random. Users can also access an image generator through ChatGPT, powered by OpenAI's DALL-e3 model.

Refine ChatGPT outputs with greater precision with Canvas

In October 2024, OpenAI released a 'beta' update to ChatGPT Plus users called Canvas, which allows users to directly edit and refine outputs within the ChatGPT interface. Canvas gives users greater control over specific elements of the output, allowing them to modify precisely what they want instead of relying on the "regenerate response" feature, which users often use when the initial output does not meet their expectations.



The fact that Canvas offers the ability to make targeted adjustments is particularly useful for those who find some parts of an output appealing but need to adjust other parts. In this sense, it can be argued that using Canvas may foster the development of critical evaluative judgment skills, a crucial aspect of AI / digital literacy.

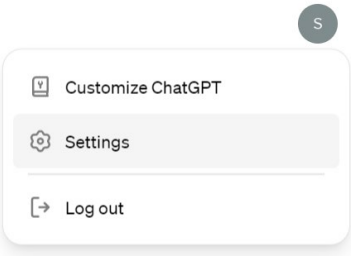
Within the Canvas window, users will find an editor for making changes directly, accompanied by contextual buttons depending on whether they're working with text or code. For text, users can adjust formality, modify length, add complexity or simplify content, and adapt language for different audiences – ranging from kindergarten level to graduate students. For code, users have options to add comments, log information and fix bugs. Currently, Canvas is available only to Plus and Team users but OpenAI plans to make it freely accessible once it exits the beta phase.

GETTING STARTED WITH CHATGPT

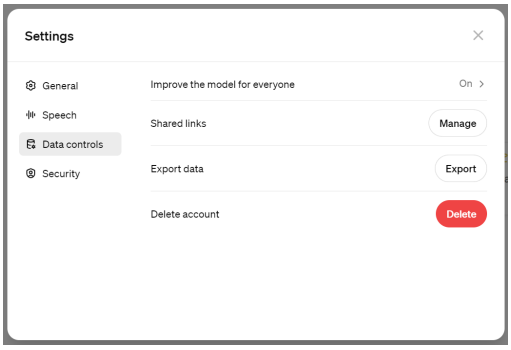
Before you start, please have your OpenAI ChatGPT login details to hand. You may need to refer to the handout on 'How to set up a ChatGPT account (free version)' first.

If you are using your University of Reading email address for your ChatGPT account, **the following is a mandatory step** to help you stay in control in relation to how the data you type into ChatGPT is used for the training of OpenAI's LLMs:

1. In the top-right corner, select your account name or initial and from the drop-down menu that appears, select '**Settings**'

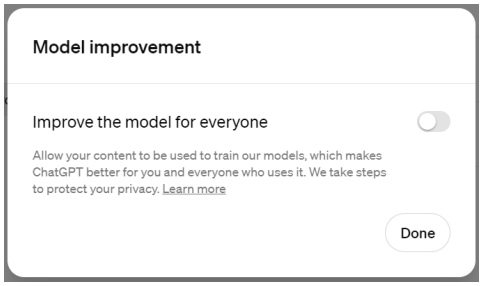


2. In the **Settings** window, select **Data controls** and toggle the option that relates to **Improve the model for everyone** – note the default option is switched On – select **On >**

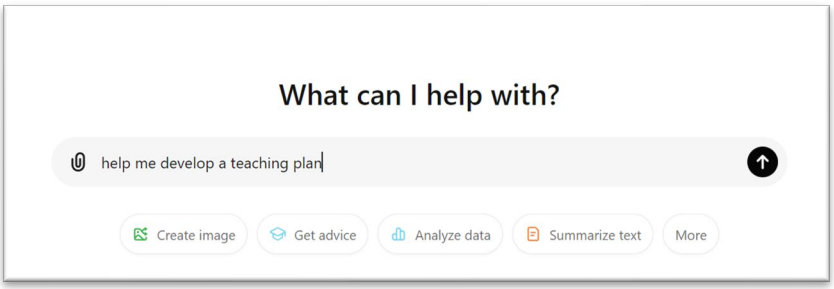


3. Then *uncheck* the **Improve the model for everyone** option so it goes from being on to being off

Then select **Done**



4. Ensure that **the Improve the model for everyone** option is **Off** and close the Settings window.
5. Type a question (otherwise known as a 'prompt') and press the **[Enter]** key or select the arrow button on-screen – but please do note the 3 golden rules first! – see next page.



There is a paperclip icon at the left of the question box (see above). This can be used to upload files that you wish ChatGPT to analyse as part of your prompt. In the example screenshot above, we might have uploaded some lecture notes and files containing details of the module we were teaching from in order to create a meaningful teaching plan.

GETTING STARTED WITH COPILOT

Microsoft Copilot, formerly known as Bing Chat, is integrated into Microsoft's Bing search engine, as well as Windows 10, Windows 11, and the Microsoft Edge sidebar. Standalone Copilot apps are also available for both Android and iOS.

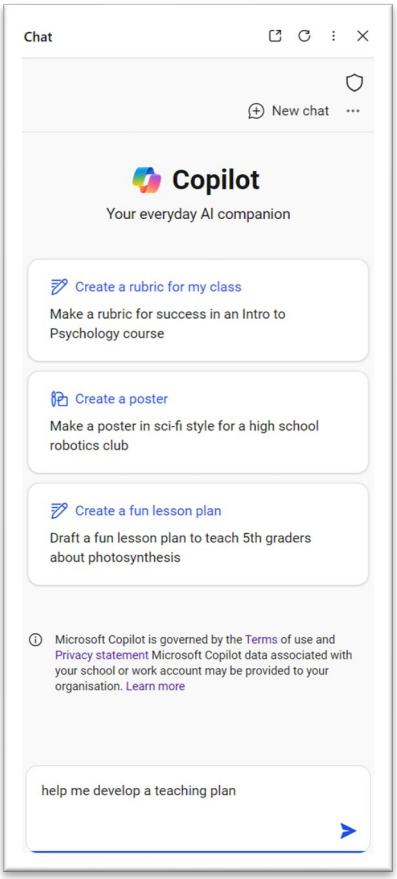
Due to the close partnership between OpenAI and Microsoft, Copilot is similar to ChatGPT, utilising fine-tuned versions of OpenAI's models. Like ChatGPT and Google's Gemini, Copilot can browse the web (via Bing) for real-time information.

Copilot also creates images through Microsoft's Image Creator, based on OpenAI's DALL-e3, and generates songs via Suno, an AI music platform. Simply type prompts like "Create an image of a kangaroo" or "Generate a song with a jazz rhythm" to activate the tools.

Copilot is accessible to all UoR staff and students for free through the Edge browser. Digital Technology Services (DTS) are currently assessing the proposition of Microsoft 365 Copilot (the Copilot for the 365 office suite) and we will endeavour to keep staff up-dated with regards to this.

To access Copilot in the Edge browser:

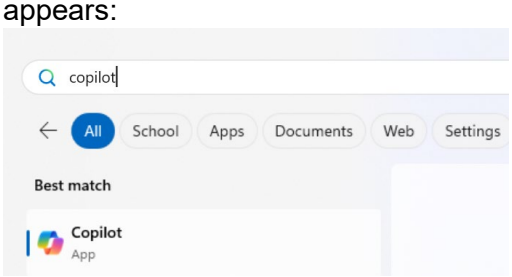
1. Open a Microsoft Edge browser window by selecting the Edge icon on the taskbar
2. In the top-right of the Edge window, select the Copilot icon
3. A Copilot side-window will appear. Type a prompt into the box at the bottom, again bearing in mind the 3 golden rules for safe use of GenAI (on the next page), and press the **[Enter]** key or select the arrow button on-screen:



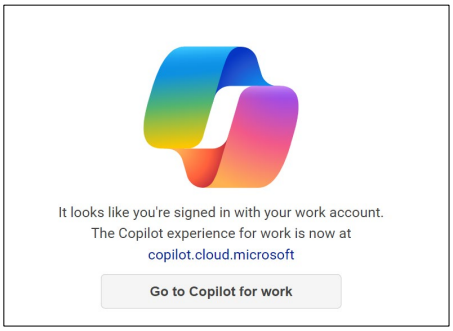
Sometimes, the attachment icon in this view of Copilot will not be available, which can pose a limitation when we want to upload files to accompany our prompts. If this is the case, it is better to access Copilot from the Start menu of your UoR PC / laptop.

To access Copilot from the Start menu:

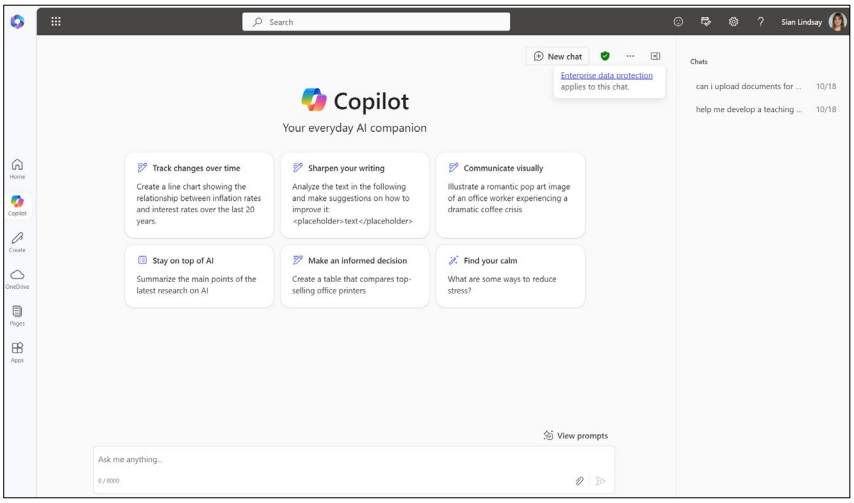
1. Click on the **Start** menu on the taskbar.
2. Type 'copilot' into the search bar and select the Copilot app that appears:



3. Select the **Go to Copilot for work** button in the dialogue box:



4. Copilot will launch in an Edge browser window:



Note the pop-up box appears when you hover over the green shield: *Enterprise data protection applies to this chat*

5. Note that the prompt box at the bottom offers the ability to add files to accompany your prompt. Also note that your prompt is limited to 8000 characters.

3 GOLDEN RULES FOR SAFE USE OF GENAI (DATA CONTROLS)

In this guide we're focusing on ChatGPT and Copilot, however there are thousands of GenAI tools available to use! As a responsible user of these tools you need to find out how to toggle the data control settings that apply to these. If you can't find or can't access these settings, please follow the golden rules for safe GenAI use below.

1. Do not input sensitive personal data, such as names, addresses, phone numbers, student numbers, usernames, email addresses or any other identifiable information. Anonymise where necessary, using pseudonyms or general terms instead of real names and specific details.
2. Do not input student assignments, confidential business, commercial, research, R&D information or proprietary data.
3. Ensure that you are using a secure connection (HTTPS) when accessing ChatGPT to prevent data interception.

Useful resources related to maintaining privacy and compliance with data protection regulations:

University of Reading guidelines (produced by IMPS, May 2024): Data Protection and AI (reading.ac.uk)

OpenAI Usage Policies: These policies provide guidelines on what is permissible when using OpenAI's models, including data protection practices: Usage policies | OpenAI

OpenAI Privacy Policy: Details on how OpenAI handles user data

and what measures are in place to protect it: openai.com/en-GB/policies/privacy-policy/

Enterprise data protection in Microsoft 365 Copilot and Microsoft Copilot

General Data Protection Regulation (GDPR): General Data Protection Regulation (GDPR) Compliance Guidelines

UK ICO Data Protection Principles: A guide to the data protection principles | ICO

PROMPT ENGINEERING

"Prompt engineering" is very much a phrase synonymous with the widespread prevalence of GenAI tools, indeed 'prompt' was the Oxford dictionary's 2023 word of the year! Prompt engineering describes the art of communicating with a GenAI model. It's about asking questions in a way that gets you the answer you want. When writing prompts you need to be specific about what you want the GenAI to do. The table on the next page[1] outlines components you can consider when creating prompts, together with an example.

The process of prompt engineering involves you critically evaluating GenAI outputs and then refining your prompts in an iterative way through back-and-forth conversations. You can also ask a GenAI tool to ask you questions about *how* it should perform the task before it starts (e.g. a role play).

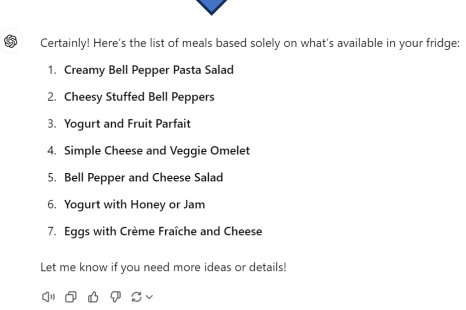
Fun prompts to get you started

- Plan an itinerary with different budget levels to take a trip to visit friends in Florida in April. We want to visit the Kennedy Space Center and Universal Studios for the kids….
- Write me a funny birthday rap for my brother who will be 40 next month. Here are his likes and dislikes to get started…
- Create a dialogue between two characters with opposing worldviews, one from a medieval kingdom and one from a cyberpunk future.
- I've attached photo of our pet guinea pigs, come up with a funny story about their secret life when we're not around.
- Here's one of my favourite landscape photos taken during the day, can you edit it into a night-time or winter scene?
- Can you create a visual story showing the evolution of my family over time – I have attached the photos where filenames are the family members and their year of birth, and a file explaining their history. Can you also align their years of birth to key events in world history.
- If I upload a photo showing the contents of my fridge, can you suggest some meals to prepare?

CRITICALLY EVALUATING GENAI OUTPUTS

It is **essential** that you are critical in evaluating the output of any GenAI tool. **These tools do get things wrong**. Their convincing responses, programmed to be naturally conversational and 'human'-like mean that we can be tricked in trusting the output.

There is somewhat of a myth that GenAI tools are able to read in files such as research articles, spreadsheets and code, and assess their contents *completely* and accurately. This is not true! Please cross-reference GenAI outputs with other sources of information (even with the outputs of other GenAI tools) and apply your critical judgement, testing the outputs as appropriate.



Certainly! Here's the list of meals based solely on what's available in your fridge:

1. Creamy Bell Pepper Pasta Salad
2. Cheesy Stuffed Bell Peppers
3. Yogurt and Fruit Parfait
4. Simple Cheese and Veggie Omelet
5. Bell Pepper and Cheese Salad
6. Yogurt with Honey or Jam
7. Eggs with Crème Fraîche and Cheese

Let me know if you need more ideas or details!

[1] Adapted from Eager, B., & Brunton, R. (2023). Prompting Higher Education Towards AI-Augmented Teaching and Learning Practice. *Journal of University Teaching & Learning Practice*, **20**(5). https://ro.uow.edu.au/jutlp/vol20/iss5/02/

CATEGORIES OF PROMPTS

COMPONENT	PURPOSE	EXAMPLE
Role	Tells GenAI how to act/behave.	'Act as an expert in social media marketing'
Verb	Indicates the specific action to be performed.	'Write…'
Object	Provides the process, product, or outcome of the action to be performed (in relation to the 'verb').	'….a case study…'
Context /Condition	Narrows down the scope and clarifies what the content should include.	'…for a first-year undergraduate marketing module. The case study should illustrate the challenges faced by a small business in developing a social media marketing strategy for attracting new clients.'
Alignment	Tells GenAI to align content with your intended goals.	'The case study will be used to support students' achievement of [insert learning outcomes].'
Constraints	Notes any parameters that the GenAI tool should adhere to.	'- The case study should be approximately 1500-words, - include a brief description of the business, - describe the challenges faced by the business in relation to designing and delivering a social media strategy, and possible solutions, and - include case questions for the students to discuss in class.'

TEACHING & LEARNING PROMPTS

For you

- Create a lesson plan for a final year undergraduate lecture on [topic] that addresses the following [learning outcomes]. The lecture is 50 minutes long. The plan should include a brief outline of the content to be covered and suggested active, collaborative learning activities to support student learning.
- Act as an expert learning designer. I teach a module about Bioengineering to 1st year undergraduates. My learning outcomes are [insert /attach learning outcomes]. Can you suggest some ideas for authentic assessment tasks to assess these learning outcomes?

For your students

- Provide me with a list of 20 key terms I will need to understand in my first year [insert programme] degree. Each term should be separated from its definition by a comma and appear on a new line.
- I am a 2nd year undergraduate student studying [insert topic]. Create a short answer and multiple choice quiz that tests my understanding.

References and Further Reading

Bearman, M., Tai, J., Dawson, P., Boud, D., & Ajjawi, R. (2024). Developing evaluative judgement for a time of generative artificial intelligence. *Assessment & Evaluation in Higher Education*, 1–13. https://doi.org/10.1080/02602938.2024.2335321

CQSD. (2023). *Generative Artificial Intelligence: Guidance for Staff*. URL: https://www.reading.ac.uk/cqsd/artificial-intelligence/ai-guidance-for-staff

Duarte, F. (2024, April 30). Number of ChatGPT users (May 2024). Exploding Topics. https://explodingtopics.com/blog/chatgpt-users

Lindsay, D. (2024, July 18). *The LLM citation crisis: Lessons learnt on the use of LLMs for research purposes* [PowerPoint presentation]. University of Reading AI Community of Practice. https://bit.ly/LLMcitationcrisis

Vogel, M. (2024, January 16). The generative AI list of lists: 5000 models, tools, technologies, applications, & prompts. Medium. https://medium.com/@maximilian.vogel/5000x-generative-ai-intro-overview-models-prompts-technology-tools-comparisons-the-best-a4af95874e94 .

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.