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## AI Literacy in Practice

Exploring the critical and ethical use of Generative AI for learning, teaching and assessment

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**What are your priorities for AI Literacy  
in your discipline?**

What do people need to think, know, feel or understand  
in order to be AI literate?

# Agenda

- 1 Introduction, Imperial context
- 2 What are your priorities for AI Literacy?
- 3 A proposed framework for AI Literacy competencies and skills
- 4 Examples from two Imperial case studies
- 5 Group discussion to generate ideas for discipline-specific competencies
- 6 Brief Q&A and wrap-up

# Aims

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**What are your priorities for AI Literacy in your discipline?**

What do people need to think, know, feel or understand in order to be AI literate?

# An AI Literacy framework for Imperial



a



b

## A proposition

Adapted from [\*A New Curriculum for Information Literacy\*](#) (a)

And Newcastle University's [\*Artificial Intelligence Literacy\*](#) checklist (b)

# An AI Literacy framework for Imperial

## Top-level competencies

1. Searching for information
2. Critical evaluation of information
3. Ethical use of information
4. Creating and communicating information
5. Understanding the AI environment

# AI Literacy competencies

## With examples of associated skills

### 1) Searching for information

- Identify appropriate sources of information for academic and other uses
- Develop an appropriate research question
- Construct efficient search strategies using keywords, subject headings and appropriate search functions (e.g. Boolean operators, truncation)
- Refine search strategies to optimise results
- Apply effective search or strategies appropriate for a range of tools (e.g. databases, gen AI tools)

### 2) Critical evaluation of information

- Evaluate information sources for currency, relevance, authority, accuracy, reliability and purpose.
- Consider the strengths and weaknesses of different sources and types of information
- Evaluate source materials within the wider debate
- Learn techniques of skimming, scanning and deep reading
- Transfer the skills of critical evaluation and deploying information to daily life

### 3) Ethical use of information

- Understand how to avoid plagiarism, deliberate or inadvertent
- Use correct academic practice in quoting, citing and paraphrasing
- Understand how copyright and IPR issues impact your work
- Understand ethical and legal sharing and use of information
- Understand key ethical issues surrounding use of AI for academic work

# AI Literacy competencies

## With examples of associated skills

### 4) Creating and communicating information

- Develop a level of rigour with academic and scientific writing
- Use evidence to justify and articulate a position
- Appropriately develop the structure and content of academic outputs (e.g. reports, essays, posters, literature reviews)
- Understand open access principles and dissemination practices in scholarly communications
- Manage your online identity and understand digital footprints

### 5) Discipline-specific management of information

- Identify discipline-specific information sources and develop strategies for their use
- Understand use of language, terms and academic idiom in the discipline
- Critically understand and recognise what constitutes expert knowledge
- Use information appropriately to articulate and analyse problems
- Develop new insights (and knowledge) in the discipline

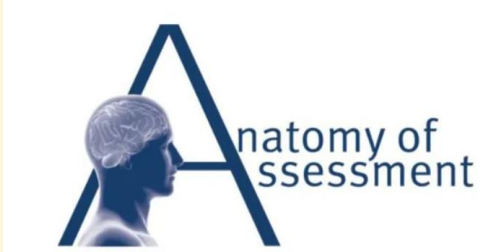
### 6) Understanding the AI environment

- Recognise when you are using AI
- Select and use generative AI tools critically
- Make informed decisions about using AI for academic work
- Develop critical awareness of how computers learn from data
- Understand ethical issues related to AI including bias, privacy, misinformation, transparency
- Apply principles of prompt engineering to produce optimal outputs



# Example of AI for assessment: Helping students use AI better (from Dr Mike Tennant, CEP)

Searching for information



Full slides are available from the downloads section at the bottom left

- MSC in Environmental Technology
- The use of AI allowed in line with College recommendations for what is appropriate
- Students undertake AI briefing comprising of:

- ➔ Introduction to how LLMs work and how they understand 'meaning'
- ➔ College and departmental guidelines around AI with a practical discussion of the do's and don'ts
- ➔ **Prompt engineering**
- ➔ Ideas around how AI can support learning and assessment

## How prompt engineering is discussed

Prompt Engineering part of the briefing:

- Appreciating the value of prompt engineering for getting a good output
- Guidance on how to approach writing prompts
- Exercises to practice writing effective prompts

## Interacting with LLMs using “Prompt Engineering”

- Remember that the output of a LLM is determined by both what the system has been trained on and what information you give it
- Prompt engineering means tailoring your questions and input so you can get the most out of an LLM
- Prompts can take many forms, from instructing the LLM to take on a role (e.g. a helpful teacher, a pirate) or guiding the way it should process its output (e.g. “chain of thought” or a particular method).

## LLMs can help you engineer prompts

- prompts shouldn’t be too precise (“What’s the capital of England?”), or too vague (“Tell me about sustainability”)
- sometimes you may not know how to ask an LLM to do a task
- ask it what it needs and collaborate with it

E.g.

- “What could I ask you to help me refine my aims for an essay?”
- “Do you need any more information?”

## Exercise: Role Play

- We're all prone to group-think, bias and defensive thinking or aggressive actions. This ideology isn't good for progress!
- LLMs can help us understand other's points of view by playing the role of people who may think differently from us. Think of them as providing a "safe space" for ideological debate!
- In pairs, think of a group of people who differ ideologically from you e.g.
  - right wing – left wing;
  - capitalist – socialist;
  - nationalism – globalism
  - feminism – traditionalism
  - authoritarianism – libertarianism
- instruct your LLM to adopt these two roles and debate net zero. Tell it to strictly keep to these roles.
- ask the LLM to analyse the conversation and recommend some further reading

## Exercise: Testing your understanding *(to do later)*

- You can instruct an LLM to test your understanding of a topic using multiple choice questions and free-form answers
- Try to set this up, noting:
  - it will very likely default to a standard "one correct/three incorrect" MCQ model
  - ask it what other formats it knows about
- make sure to instruct it to stop after each question and explain the answer once you've entered your response.
- see if you can get it behave like a computer-aided testing ("CAT") system

## Exercise: Socratic Conversations *(to do later)*

- The Socratic method in teaching is where the teacher asks you open-ended questions to help explore a topic
- Helps critical thinking, wider and deeper understanding
- Easy to set up in an LLM

### Ask your LLM

- to take the role of a helpful teacher
- to explain the steps involved in Socratic conversations
  - this acts as a guide
- to prompt you for a topic and then use those steps as part of Socratic conversation
- you may have to intervene until you get correct behaviour. Remember that this acts to guide the LLM!

## Exercise: Understanding Complex Concepts

- I'm going to ask you to simplify a piece of text using your LLM of choice. Choose either of the examples in the "notes" box
- Firstly, I'd like you to think through the process – how would you do it manually?
  - what strategies would you use?
  - what would you focus on?
- In pairs, spend 5 minutes detailing the steps you would take to manually simplify a text so you can understand it.
- You should then work with the LLM to help you understand your text
- *Further application:* working with an LLM to help you with your aim and objectives for your SGS essay. Note: the rubrics are online.

# Framework for teaching prompt engineering

## C – CONTEXT

Begin by selecting a context from the available options or by precisely outlining the topic or subject you would like ChatGPT to concentrate on

## R – RESULT

Identify the desired outcome or result you aim to accomplish with ChatGPT. Pick from the given list or illustrate a similar objective.

## E – EXPLAIN

Provide a detailed explanation of your request, including any crucial information that will assist ChatGPT in understanding the context and expected outcome more effectively.

## A – AUDIENCE

Define the target audience by considering factors such as age, interests, occupation, and demographics.

## T – TONE

When writing, select an appropriate tone that aligns with the content's purpose and intended audience.

## E – EDIT

After ChatGPT produces a response, thoroughly examine and modify the content using suggested editing techniques (e.g. expand, modify, shorten, etc.) to ensure it corresponds with your desired result.

By adhering to the C.R.E.A.T.E method for creating prompts, you can enhance your engagement with ChatGPT and achieve remarkable results tailored to your individual requirements and objectives.

Context	Result	Explanation	Audience	Tone	Edit
1. Copywriter	1. Email	1. Summarizing	1. Business Owners	1. Persuasive	1. Explain
2. Author	2. Book	2. Explaining	2. Men	2. Engaging	2. Iterate
3. Doctor	3. Website	3. Creating	3. Women	3. Serious	3. Expand
4. Lawyer	4. Outline	4. Comparing	4. Young adults	4. Informative	4. Modify
5. Engineer	5. Summary	5. Contrasting	5. College Students	5. Entertaining	5. Add
6. Marketer	6. Manual	6. Evaluating	6. Parents	6. Conversational	6. Delete
7. Statistician	7. Procedure	7. Narrating	7. Seniors	7. Professional	7. Revise
8. Journalist	8. Agreement	8. Analyzing	8. Teenagers	8. Friendly	8. Rewrite
9. Writer	9. Content	9. Defining	9. Entrepreneurs	9. Inspirational	9. Summarize
10. Personal Trainer	10. Script	10. Persuading	10. Investors	10. Humorous	10. Simplify
11. Trader	11. Speech	11. Informing	11. Freelancers	11. Authoritative	11. Reorganize
12. Financial Analyst	12. Press Release	12. Entertaining	12. Engineers	12. Objective	12. Paraphrase
13. Portfolio Manager	13. Business Plan	13. Predicting	13. Developers	13. Descriptive	13. Update
14. Venture Capitalist	14. Review	14. Offering	14. Travelers	14. Emotional	14. Proofread
15. DevOps Engineer	15. Optimize	15. Synthesizing	15. Homeowners	15. Analytical	15. Fact-check
16. Graphic Designer	16. Critique	16. Detailing	16. Remote workers	16. Concise	16. Rephrase

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## Example of AI for assessment: Optional use of LLMs for group design challenge (from Dr Maria Parkes, Bioengineering)

- 1st year UG **Design & Professional Practice module** that supports students to discover the principles of engineering design and broaden their practical skills as they utilise appropriate tools and software to solve a variety of design problems.
- 40%-weighted assignment called 'Design Challenge'
- Around 180 students working in groups of 5-7
- Module assignment brief:

*Design a desktop pot plant inspired by the field of bioengineering. Submit a project report detailing the design process, the final design, and the bioengineering inspiration for the design.*

## How LLMs were used and introduced for this assignment?

- Kick-off session on assignment briefing and referencing guidelines, including an introduction to using GenAI such as ChatGPT as a potential tool to support student design process
- Lecture includes questions on how to generate design ideas – leading to a discussion of generative AI and LLMs
- Demonstration of its potential by running real-time queries relevant to the project; discussing the potential and limitations of using AI in engineering design.
- Option to use ChatGPT or any other LLMs, with appropriate referencing.



You

Please give me ideas for designing a sustainable plant pot inspired by the field of bioengineering.



ChatGPT

Designing a sustainable plant pot inspired by bioengineering is a creative and environmentally conscious project. Here are some ideas to get you started:

1. **Biodegradable Materials:**

Use biodegradable materials such as bioplastics derived from renewable resources like cornstarch or sugarcane. This ensures that the plant pot breaks down naturally over time, reducing environmental impact.

2. **Mycelium-Based Pot:**

Explore mycelium-based materials as a bioengineered alternative.



# Students' use of LLMs vs. Non-use

## Reasons for using LLMs:

**Design concept** – ideas generation

**Material selection** – developing prompts to find suitable materials

**Search engine** – for further research

**Grammar and language** – to refine sentence structure and technical language

**Coding** – generate code to programme sensors for prototype

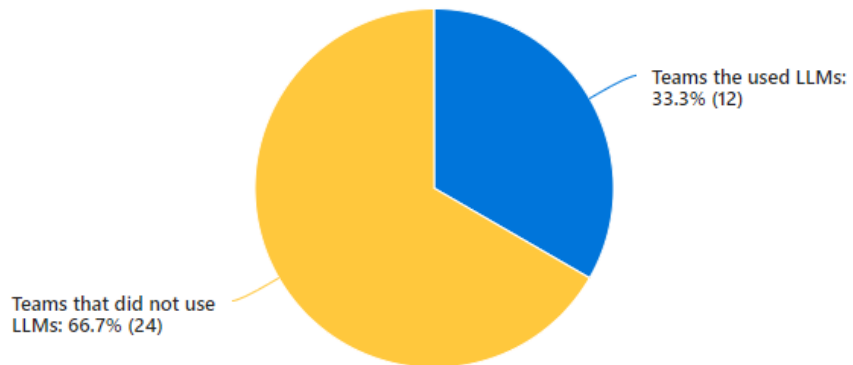
## Reasons for not using LLMs:

Lack of citations from ChatGPT output

Incorrect responses from LLMs

Lack of creativity in LLM outputs

How many teams used LLMs?



Reference: From a case study by Bioengineering UROP students who evaluated the use of AI for this assignment.

# Examples of student practice: from ChatGPT to project prototypes

## Example: *The 'SelfWatering' Plant*

- Team's goal: designing a plant pot for growing tomatoes, which require nutrient-dense soil, frequent watering, etc.
- Brainstorming ideas with GPT-4
- Students discussed ideas and considered different factors to make their informed decision as a group. (*Critical evaluation of information*)

Reference: From a case study by Bioengineering UROP students who evaluated the use of AI for this assignment.



You

Design a plant pot that is sustainable and future proof. It must be suited for indoor plants and tomatoes



ChatGPT

Designing a sustainable and future-proof plant pot for indoor plants and tomatoes involves several key considerations to ensure it is both environmentally friendly and adaptable to various plant types. Here's a comprehensive design proposal for such a plant pot:

### Material Choices

1. **Recycled Materials:** Use recycled plastics or biodegradable materials like bamboo fiber, coconut husk, or recycled wood pulp. These materials are sustainable and have a lower environmental footprint.
2. **Durability:** The material should be durable to ensure longevity and reduce the need for frequent replacements.

### Design Features

1. **Modularity:** A modular design that allows for different configurations. For instance, individual pots could be stacked or linked together to accommodate more plants or different types of plants like tomatoes which require more space as they grow.
2. **Self-Watering System:** Incorporate a water reservoir at the bottom of the pot that allows for capillary action to water the plants as needed. This system conserves water and ensures plants receive a steady amount of moisture, which is particularly beneficial for tomatoes that require consistent watering.
3. **Adjustable Lighting:** Include an integrated, adjustable LED grow light for situations with insufficient natural light. This feature is particularly useful for indoor environments and during less sunny months.
4. **Smart Technology:** Equip the pot with sensors to monitor soil moisture, nutrient levels, and environmental conditions like temperature and humidity. A connected app can provide notifications and tips for optimal plant care.
5. **Ventilation:** Ensure the pot design allows for adequate air circulation around the roots, which is crucial for the health of both indoor plants and tomatoes.



## Challenges with referencing LLM outputs

- LLMs can be used for a wide range of purposes and contexts. How should students reference properly or is referencing needed? Would students be allowed to use LLM generated code for their assignments, and how are they expected to reference it?
- Communication and transparency are important.

USE CASE	Free to Use without Reference	Simple Reference to Acknowledge Use	Reference + Report Primary Prompt	Reference + Report Primary Prompt + Report Chat History	Use Prohibited
Generating Code using LLMs				X	
Using LLMs for linguistic assistance		X			
Using LLMs to aid in research			X		
Using LLMs to generate design concepts			X		
Using LLMs to generate large portions of text					X

Reference: From a case study by Bioengineering UROP students who evaluated the use of AI for this assignment.

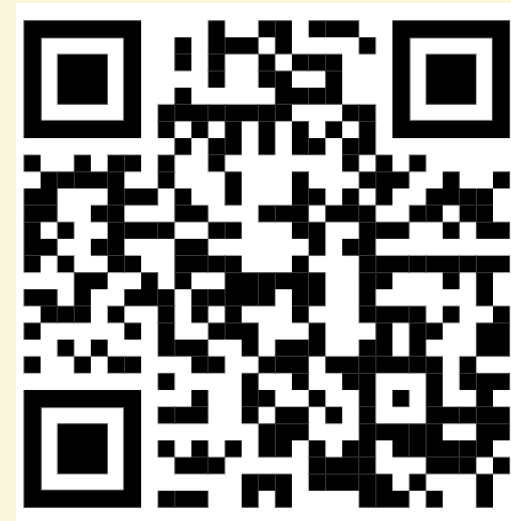
## Group discussion

### AI Literacy competencies

1. What strategies can you use to incorporate gen AI into your own teaching, learning and assessment practice? Please add these to the Padlet.

2. What challenges can you identify around ethical and equitable use?

QR code to Padlet



Link to Padlet:

<https://padlet.com/anijhoff/AILiteracy>

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What support do you need to embed AI literacy into your teaching or assessment practice?

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## Q & A



Link to Padlet:

<https://padlet.com/anijhoff/AILiteracy>

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