



Mentoring with Machines

Harnessing Generative AI and Prompt
Engineering for Inclusive Mentoring in
Qualitative Research

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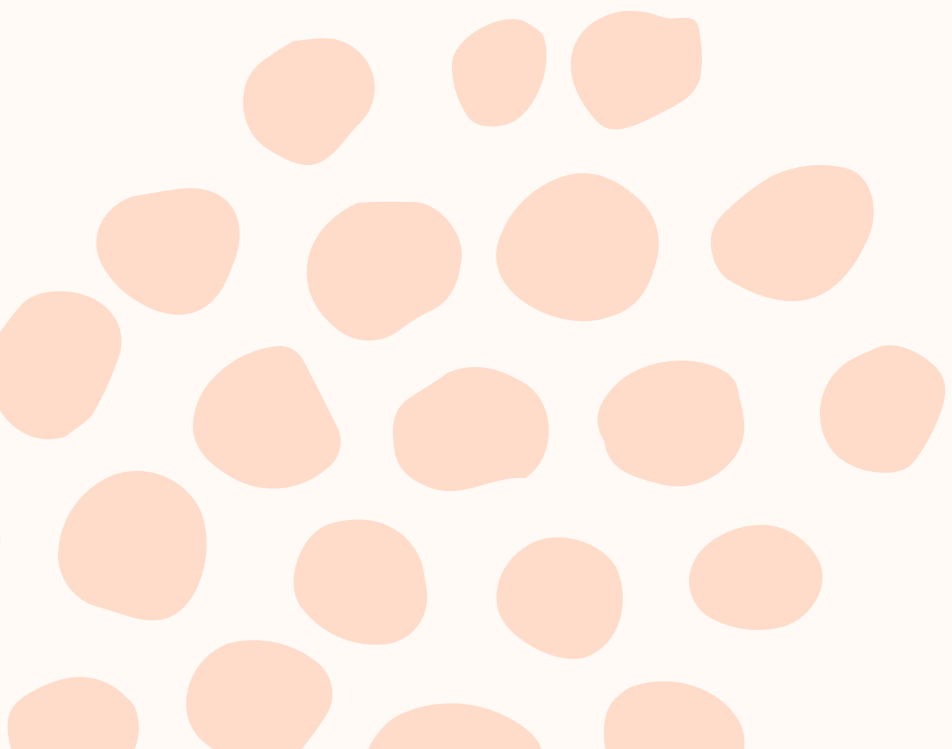
About this Session

In this workshop, we will discuss the potential of generative AI and prompt engineering to support inclusive qualitative research mentorship. We will explore how to create a variety of prompts that can be used to enhance the output quality of generative AI tools such as ChatGPT.

By leveraging these techniques, mentors can provide personalized feedback, support diverse perspectives, and improve communication. We will explore how we can use these tools in a practical way to foster equitable mentorship experiences in qualitative research settings.



Let's Reflect



Think-Pair-Share

THINK

What do you you know about AI, Generative AI, Large Language Models, and Mentoring

PAIR

Get together with one or two people sitting closest to you.

SHARE

Share your thoughts with your partner(s)



Learning Objectives

ONE: MENTORSHIP

Discuss the significance of mentorship in qualitative research

THREE: PROMPT ENGINEERING

Explore how prompt engineering can be used to refine GAI output

TWO: GENERATIVE AI

Describe how generative AI can be used to support the qualitative research process

FOUR: RISKS & ETHICAL ISSUES

Discuss risks and ethical issues relating to the use of GAI for inclusive mentoring in qualitative research



Mentorships

- Significance in Qualitative Research -



Mentoring Defined

"Mentoring is . . .

- an alliance, that creates a space for dialogue, that results in reflection, action, and learning.
- conversations that create insight.
- a synergistic relationship—two or more people, engaged in a process that achieves more than each could alone.
- interaction with another that facilitates personal and professional development.
- strategic planning for individuals."



Inclusive Mentorship

Inclusive mentorship is a co-constructed and reciprocal relationship between a mentor and mentee who take a strengths-based and identity-informed approach to working together to support their mutual growth, development and success (NASEM, 2019; Windchief, 2019).

Mentorship in Qualitative Research

"...qualitative research is best learned through active engagement in research and writing process; activities which usually require active guidance, supervision, and mentoring in order to produce quality outcomes. We are concerned that many qualitative researchers work without sufficient support and guidance to conduct and present exemplary qualitative inquiries, oftentimes contributing to negative evaluations and a general lack of appreciation of the value of qualitative work by the research community-at-large" (Chenail, Wulf, Duffy, Warner, and Sahni, 2007, p. 67).

TQR Brand



Author support and respect influenced by:

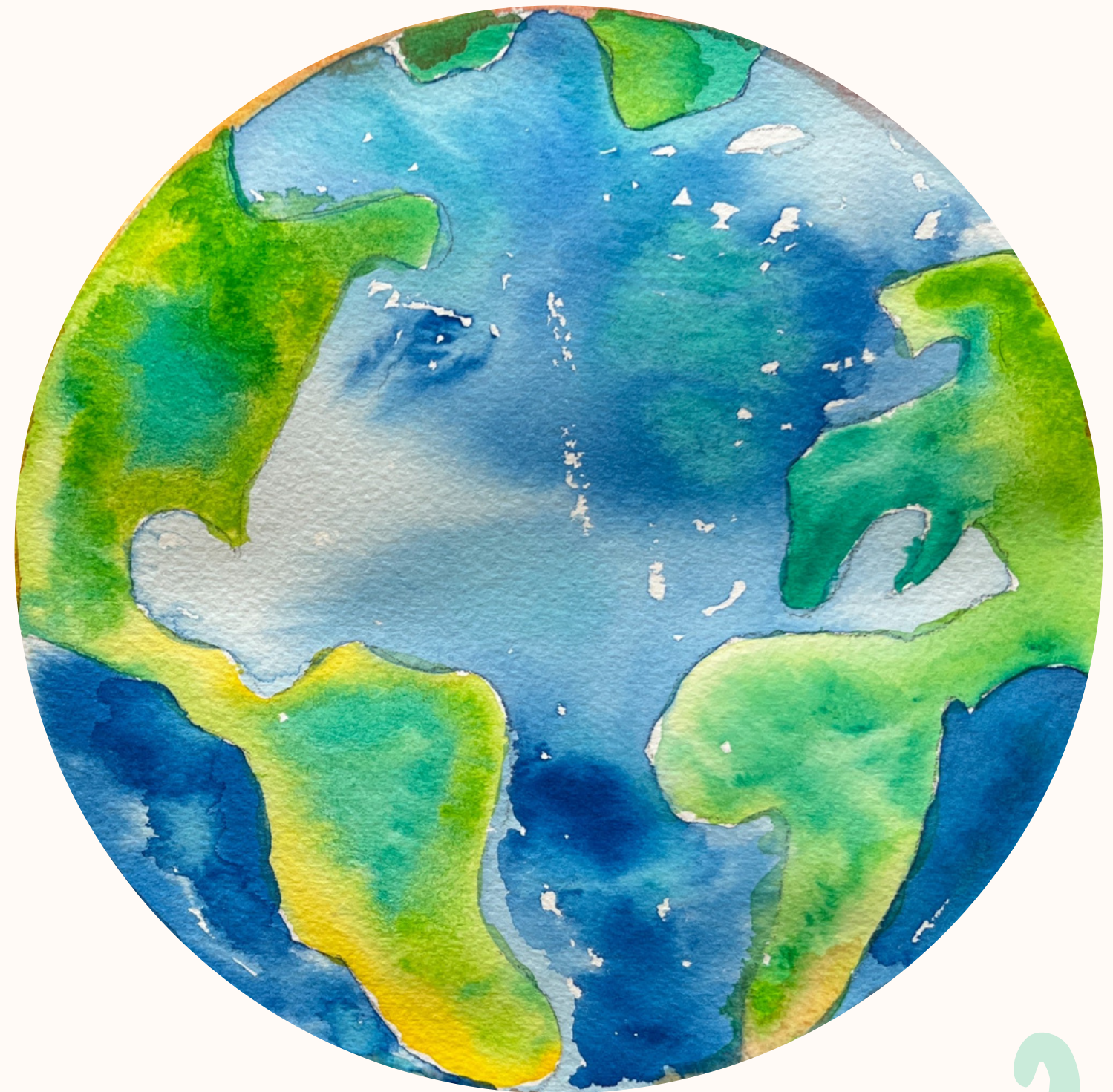
- Clinical training of editor leadership
- “positively and unconditionally accepting authors into a supportive and generative editorial relationship” (Chenail, et al., 2007, p. 69)
- Collaborative process-learning process for all (authors, editors, reviewers)
- Rigorous manuscript development program



Working with International Authors

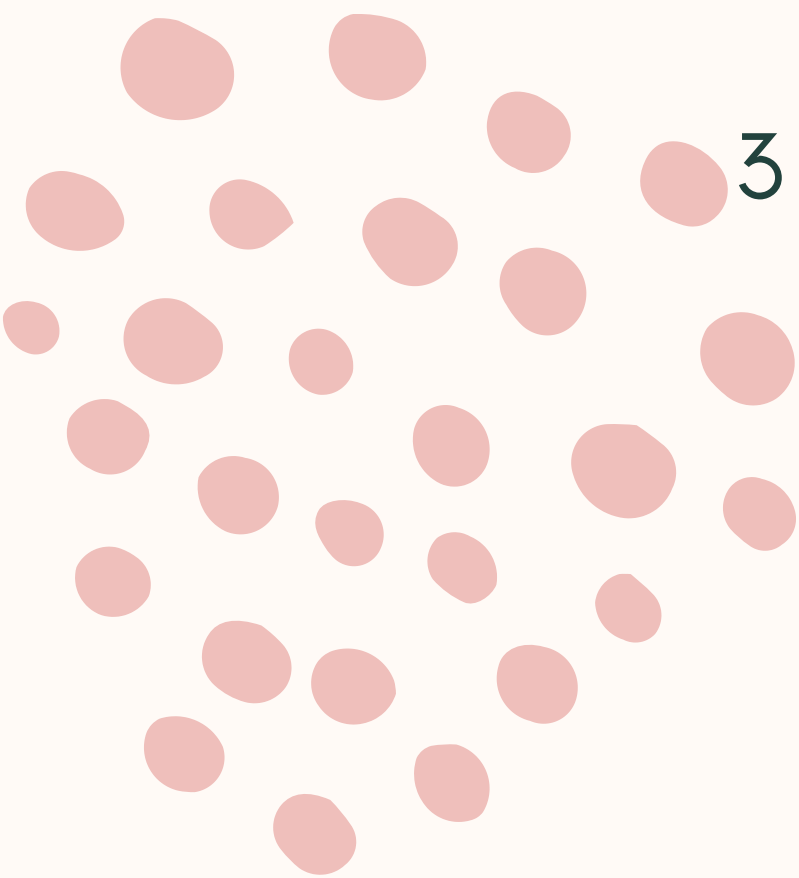
Some mentoring challenges include:

- Access to resources
- Writing formats
- Translation
- Response to mentoring process



Questions

1. How can generative AI support the qualitative research mentoring process?
2. How can generative AI support a more inclusive mentoring relationship?
3. What are the potential risks and ethical issues?





Generative AI & Qualitative Research

- Supporting the Research Process -

Alphabet Soup

ARTIFICIAL INTELLIGENCE (AI)

The overarching field that encompasses all technologies and systems designed to simulate human-like intelligence.

GENERATIVE AI (GAI)

A subset of AI focused on creating new content or data, which includes systems like large language models.

LARGE LANGUAGE MODEL (LLM)

A specific type of generative AI that specializes in generating human-like text.



(OpenAI, 2024)

Lots of AI-Enhanced Research Tools

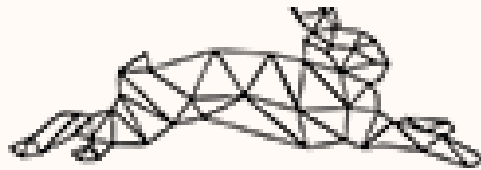


NVIVO

citavi



Quirkos



ResearchRabbit

scite_



OpenAI's ChatGPT

- Uses deep learning to produce human-like text
- Designed to generate sequences of words, code or other data, starting from a source input, called the prompt
- Trained on an unlabeled dataset (primarily English)
- GPT in 2018 used 110 million learning parameters; GPT-2 used 1.5 billion; GPT-3 used 175 billion
- Uses include summarization, translation, grammar correction, question answering, chatbots, composing emails, etc.



New Literacies

“Forget the mere cut & paste, they will need to be good at prompt & collate” (Floridi & Chiriatti, 2020, p. 691).



How ChatGPT Can Support the Research Process



Research Conception

- Idea Generation
- Background Information
- Feasibility of Ideas

Research Design

- Alignment of Problem, RQs, Goal
- Ethical Considerations
- Sampling Techniques/Strategies

Literature Review

- Summarization
- Synthesis
- Reference Management

Data Collection

- Question Refinement
- Pilot Testing
- Role-Playing (e.g., practice interview skills)
- Language Translation

Data Analysis

- Analytical Frameworks
- Interpretation/Sounding Board
- Language Translation

Research Reporting

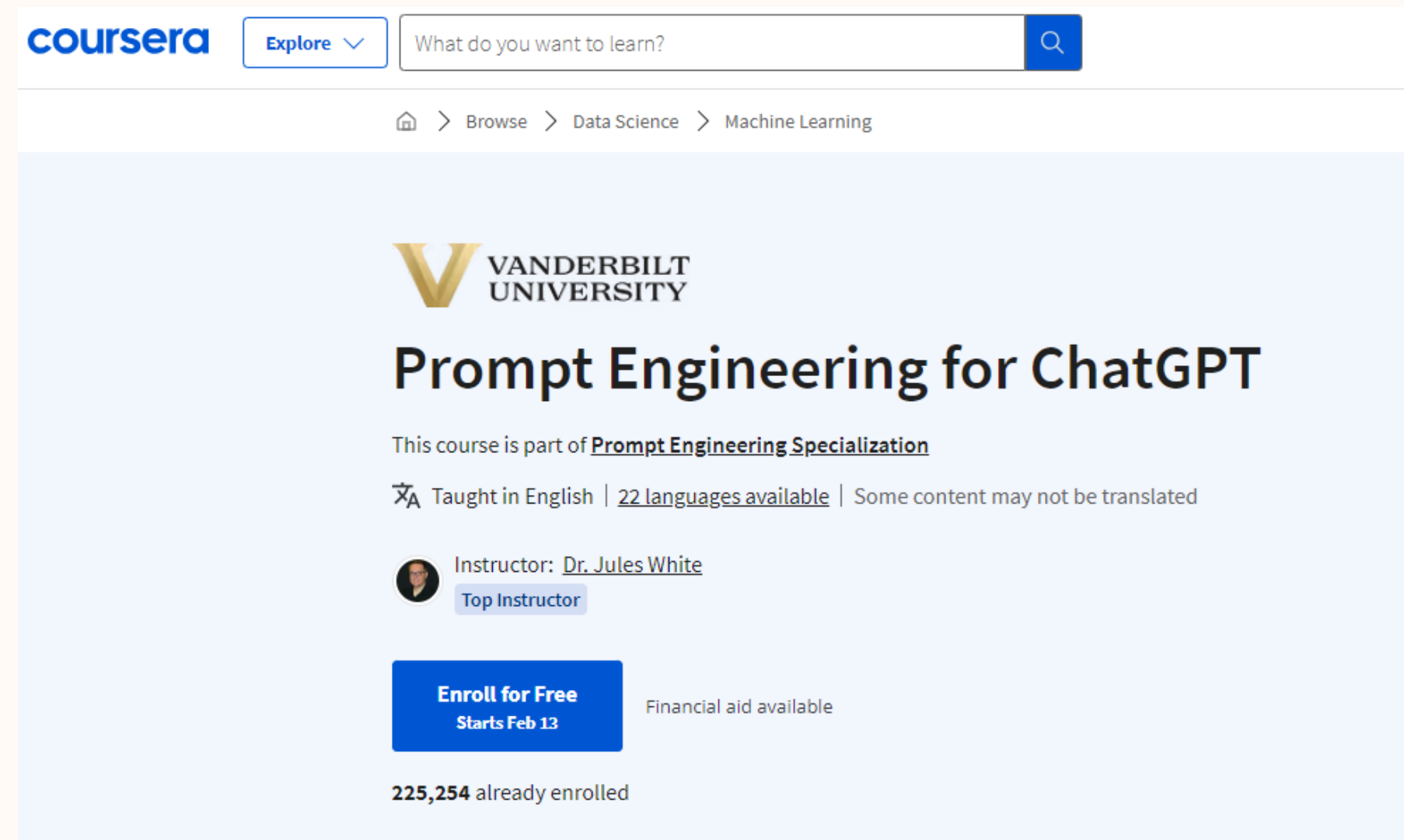
- Editing Assistance
- Abstract Writing
- Storytelling



Prompt Engineering

- Refining Output -

What Sparked My Interest



The screenshot shows the Coursera interface for the course 'Prompt Engineering for ChatGPT' by Vanderbilt University. The course is part of the 'Prompt Engineering Specialization'. It is taught in English and is available in 22 languages. The instructor is Dr. Jules White, a top instructor. The course is free to enroll in and starts on February 13. There are 225,254 students already enrolled. The page also mentions that financial aid is available.

White, J., Fu, Q., Hays, S., Sandborn, M., Olea, C., Gilbert, H., Elnasher, A., Spencer-Smith, J., & Schmidt, D.C. (2023). A prompt pattern catalog to enhance prompt engineering with ChatGPT. arXiv:2302.11382v1 [cs.SE]
<https://doi.org/10.48550/arXiv.2302.11382>

What is Prompt Engineering?

"A prompt is a set of instructions provided to an LLM that programs the LLM by customizing it and/or enhancing or refining its capabilities...a prompt sets the context for the conversation and tells the LLM what information is important and what the desired output form and content should be" (White, et al., 2023).




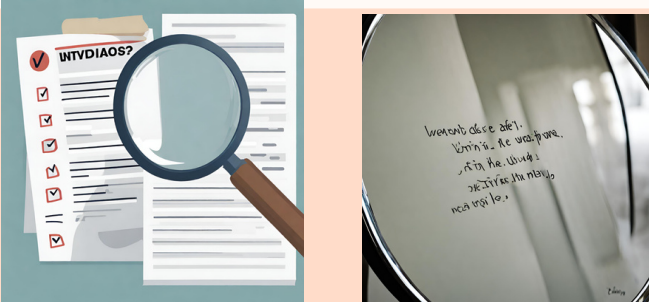


Classifying Prompt Patterns

Pattern Category	Prompt Pattern
Input Semantics	Meta Language Creation
Output Customization	Output Automater Persona Visualization Generator Recipe Template
Error Identification	Fact Check List Reflection

Classifying Prompt Patterns (cont.)

Pattern Category	Prompt Pattern
Prompt Improvement	Question Refinement Alternative Approaches Cognitive Verifier Refusal Breaker
Interaction	Flipped Interaction Game Play Infinite Generation
Context Control	Context Manager

Today's Examples (See Job Aid)

Pattern Category	Prompt Pattern
Output Customization	Persona 
Error Identification	Fact Check List Reflection 
Prompt Improvement	Question Refinement 
Interaction	Flipped Interaction 

Prompt Patterns Job Aid

5 PROMPT PATTERNS

White, et al., 2023

"A prompt is a set of instructions provided to an [large language model] LLM that programs the LLM by customizing it and/or enhancing or refining its capabilities...a prompt sets the context for the conversation and tells the LLM what information is important and what the desired output form and content should be" (White, et al., 2023).

1

PERSONA

Used for Output Customization

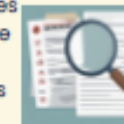


By assigning the LLM a persona, it can generate output as if it were a particular role (e.g., subject-matter expert).

2

FACT CHECK LIST

Used for Error Identification



This pattern ensures that the LLM produces a list of facts that are included in the output. This list helps the user see what facts/assumptions the output is based on.

3

REFLECTION

Used for Error Identification



This pattern is used to ask the LLM to explain the rationale behind its response. This additional information helps the user have a better assessment of the validity of the output.

4

QUESTION REFINEMENT

Used for Prompt Improvement

This pattern is used to help the user create better questions.



5

FLIPPED INTERACTION

Used for Interaction

This pattern is used to flip the interaction flow where the LLM asks the user questions.



AI ASSISTS,
HUMANS
DECIDE



5 PROMPT EXAMPLES

1

PERSONA

Prompt Pattern:

Act as persona X
Provide outputs that persona X would create (White, et al., 2022)

Example:

Act as a mentor of qualitative research. Pay close attention to the major pitfalls that novice qualitative researchers make (e.g., misalignment of research problems, research questions and methods; bias, interviewing skills, etc.). Provide outputs that a mentor with deep expertise in qualitative research would create.

2

FACT CHECK LIST

Prompt Pattern:

Generate a set of facts that are contained in the output. The set of facts should be inserted in a specific point in the output. The set of facts should be the fundamental facts that could undermine the veracity of the output if any of them are incorrect (White, et al., 2022)

Example:

From now on, when you generate an answer, create a set of facts that the answer depends on and that should be fact-checked. List this set of facts at the end of your output. Include facts in a manner that takes into consideration how the Arabic culture might interpret these research/interview questions.

3

REFLECTION

Prompt Pattern:

Whenever you generate an answer Explain the reasoning and assumptions behind your answer (Optional) ...so that I can improve my question (White, et al., 2022)

Example:

Whenever you generate an answer, please explain the reasoning and assumptions behind your selection of research methods. If possible, use specific examples or evidence to support your answer of what research method is the best selection for the research goal and questions. Moreover, please address any potential ambiguities or limitations in your answer to provide a more complete and accurate response.

4

QUESTION REFINEMENT

Prompt Pattern:

Within scope X, suggest a better version of the question to use instead. (Optional) prompt me if I would like to use the better version instead (White, et al., 2022).

Example:

From now on, whenever I ask a question about qualitative research, suggest a better version of the question to use that incorporates information specific to interpretative phenomenological analysis and ask me if I would like to use your question instead.

5

FLIPPED INTERACTION

Prompt Pattern:

I would like you to ask me questions to achieve X. You should ask questions until this condition is met or to achieve this goal (alternatively, forever) (Optional) ask me the questions one at a time, two at a time, etc. (White, et al., 2022).

Example:

I would like you to ask me questions to achieve an appropriate interview protocol for a research project. You should ask questions until this condition is met or to achieve this goal (alternatively, forever) (Optional) Ask me the questions one at a time, two at a time, etc.

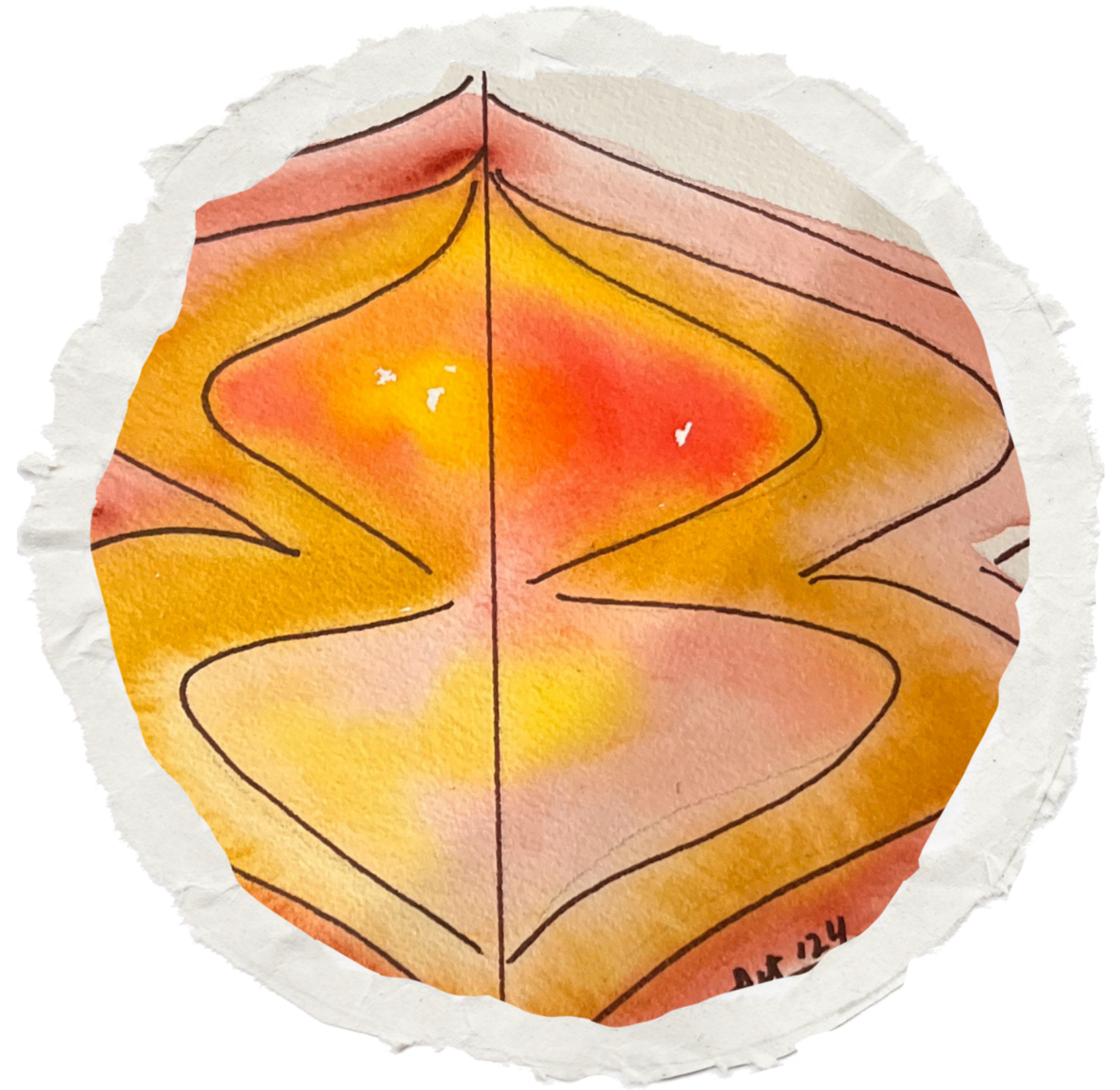


Risks & Ethical Issues

- Using GAI for Inclusive Mentorship -

Risks

- **Confabulation/Hallucination:** LLMs can produce “incorrect but plausible facts”
- **Bias:** Varies by LLM; gender, race, viewpoints, approaches, political affiliations (can be subtle)
- **Privacy:** Inputs can be used for future training
- **Instructional:** LLMs used as a crutch could undermine learning



Ethical Issues

- Data ownership and rights
- Data privacy and transparency
- Interpretive sufficiency
- Biases manifested in GAI
- Researcher responsibilities and agency
 - See Parker, Richard, & Becker (2023) for criteria for evaluating output quality



Is ChatGPT a Stochastic Parrot?

“We advocate for research that centers the people who stand to be adversely affected by the resulting technology, with a broad view on the possible ways that technology can affect people” (Bender, et al., 2021, p. 619).

A stochastic process is a random process.

○



(Bender, et al., 2021)

Policies Regarding GAI Use in Research



Australian Government
Australian Research Council

Policy on Use of Generative Artificial Intelligence in the ARC's grants programs

Version: 2023.1
Issued: 7 July 2023
Owner: Research Policy Branch

“Release of material into generative AI tools constitutes a breach of confidentiality and peer reviewers, including all Detailed and General Assessors, must not use generative AI as part of their assessment activities” (p. 3).

Policies Regarding GAI Use in Research (cont.)



**National Institutes
of Health**

“Reviewers should be aware that uploading or sharing content or original concepts from an NIH grant application, contract proposal, or critique to online generative AI tools violates the NIH peer review confidentiality and integrity requirements.”

(<https://grants.nih.gov/grants/guide/notice-files/NOT-OD-23-149.html>)

Take Aways

- Embrace the continuous learning process
- Balance benefits with risks and challenges
- Prioritize educated and ethical application
- Use prompt engineering to elicit more accurate and useful information
- AI assists, humans decide



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<https://www.unesco.org/en/articles/guidance-generative-ai-education-and-research>

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<https://doi.org/10.48550/arXiv.2302.11382>

Resources

AI for Education, A community to ensure equitable access and benefits from AI in Education, <https://ai-for-education.org/>

Committee on Publication Ethics (COPE).
<https://publicationethics.org/about/our-organisation>

Microsoft Promptbase (Public database of prompts)
ChatGPT <https://github.com/microsoft/promptbase>

Microsoft Introduction to Prompt Engineering: <https://learn.microsoft.com/en-us/azure/ai-services/openai/concepts/prompt-engineering>

Microsoft Advanced Prompt Engineering Guide: <https://learn.microsoft.com/en-us/azure/ai-services/openai/concepts/advanced-prompt-engineering?pivots=programming-language-chat-completions>

Thank You!



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