



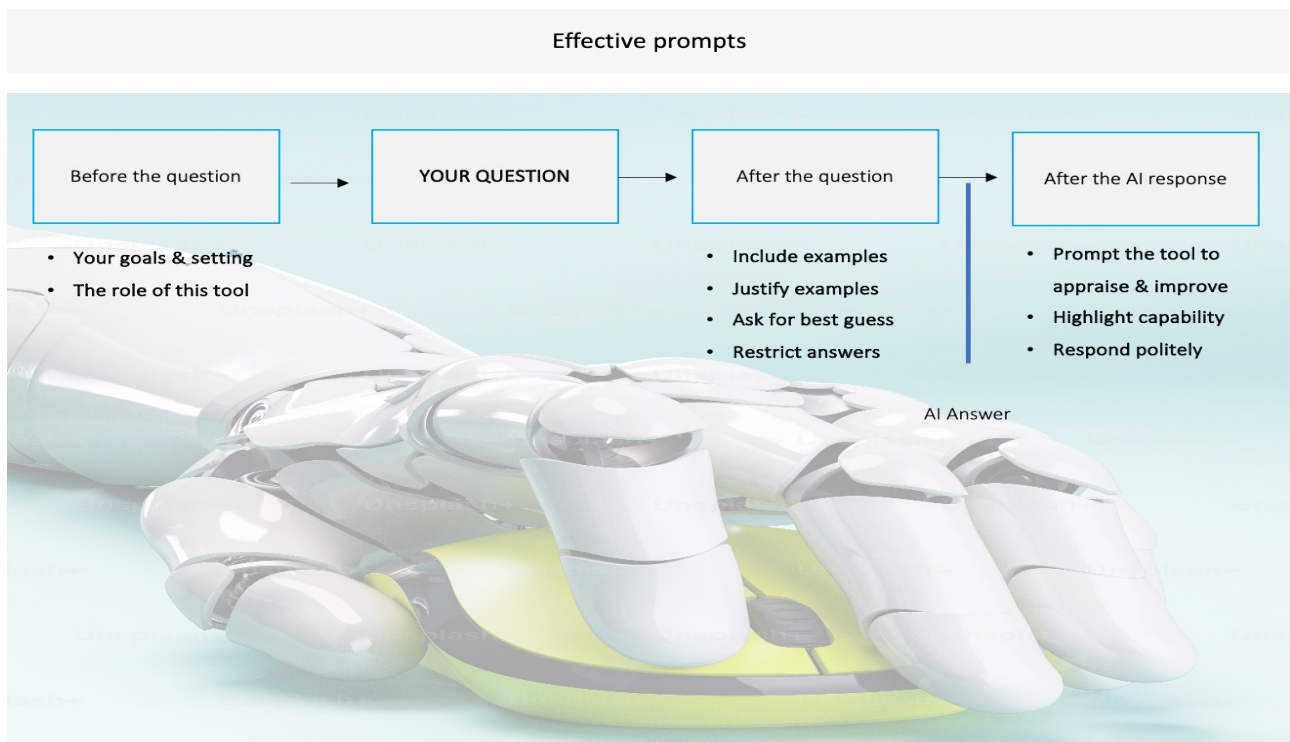
HDR HELPFUL HINTS

From the Dean of Graduate Research, Simon Moss.

Effective prompts in AI

SUMMARY

To use generative AI tools effectively, you need to know how to write your questions or prompts appropriately. This document presents some key guidelines to help you achieve this goal. The following infographic summarises these guidelines. For more insights on how to use generative AI tools effectively, you may even seek the advice of prompt engineers—individuals who offer advice on how to optimise the questions.



In practice, you do not need to master all the principles in this document. Instead, learn to interact with Chat GPT or other AI tools like you would interact with a smart robot—such as C3PO in Star Wars, Data in Star Trek, TARS in Interstellar, and so forth. That is, do not treat AI tools like Google, but instead converse as you would with a smart robot or even a fairly literal human or alien. Indeed, on many attributes, AI tools resemble humans more than perhaps they resemble machines:

- AI tools and machines do not excel on the same tasks,
- For example, machines excel on executing routines consistently or performing complicated calculations.
- In contrast, AI tools excel more on tasks on which humans are proficient: coding, chatting, or even lying.
- In one famous example that Mollick (2024) reported, the tool, when told that AI does not feel emotions, disagreed vehemently and even indicated that humans are merely cyborgs as well, because they use computers to store information, phones to communicate, and so forth.

SAMPLE QUESTIONS

To use generative AI, such as Chat GPT, you need to enter a question together with some information. The question, coupled with the information, is called a prompt. Here is an example of some typical questions that HDR candidates may write. These examples revolve around one topic—the causes of diabetes—but could readily be adapted to other topics.

TOPIC	TYPICAL QUESTION
Clarify the research question and review the literature	<ul style="list-style-type: none">• What are the main sources of controversy around the causes of diabetes—controversies that researchers have yet to resolve?• What have researchers identified as the main limitations in the research on the causes of diabetes?• What are the main topics I should consider on the causes of diabetes?• What keywords should I enter into databases, such as Google Scholar?• And what are the most recent advances in research on the causes of diabetes?• Which academics are studying and publishing on the causes of diabetes?• What theories, models, or frameworks could help me understand the causes of diabetes?

Design the methods	<ul style="list-style-type: none"> • Which qualitative methodologies could I consider to explore the causes of diabetes? • What are the benefits and drawbacks of these methodologies? • Which tools can I use to measure the risk of diabetes? • What is the cost of each measure in US dollars? • Which measure is the quickest to administer? • Which measure is the most valid or accurate? • Can you suggest some publications I should read to support these claims? • When applying these methods, what are the most common mistakes that people commit? How can I avoid these mistakes? • Which statistical technique should I use to determine whether age affects the relationship between duration of exercise and incidence of diabetes? • Can you provide an example to illustrate this technique? • What software or tools should I use to complete this technique? • What are some mistakes that researchers sometimes commit when they complete this technique? • What python or R code should I include to complete this technique?
Improve your writing	<ul style="list-style-type: none"> • Here is an excerpt of my writing. What are some helpful words that I have overlooked? • Which words could be more precise? • Which words or phrases could I delete or condense? • What are some principles I should consider to improve my writing? Can you illustrate these principles with reference to my paragraphs?

INFORMATION THAT PRECEDES QUESTIONS

If you enter these questions into an AI tool, like Chat GPT, the answers may not be especially informative. That is, the answers may not be tailored to your needs and circumstances. To illustrate, if someone utters “We should get together”, depending on the relationship, this sentence could imply

- this individual wants to visit the other person or
- this individual never wants to visit the other person.

To overcome this limitation, you should precede the question with some helpful information about your needs and circumstances. This information diminishes the likelihood the AI tool will produce generic answers that dismiss your specific needs. The following table outlines how to achieve this goal.

PRACTICE	EXAMPLES
Clarify your circumstances and preferences as comprehensively as possible.	<ul style="list-style-type: none"> • Describe your goals, such as “I am writing a scientific report and want to write the report professionally and concisely” to generate the right style of output. • Outline your study. • Clarify your challenges or limitations, such as “I need to complete this thesis within 6 months” and “My supervisor is too busy to assist at the moment”. These personal challenges tend to promote more helpful responses. • Describe your circumstances. “I study in Australia but am a citizen of Indonesia”.
Highlight the importance of this question to you	<ul style="list-style-type: none"> • “Can you please answer this question carefully and comprehensively because this matter is important to my career”.
Prompt the AI tool to assume or play a specific role.	<ul style="list-style-type: none"> • “When answering this question, can you play the role of a pedantic examiner?” • “When answering this question, can you play the role of an experienced researcher?” • “When answering this question, can you play the role of a health practitioner or manager in this field with expertise in diabetes?”

Even subtle words can shift the responses of AI tool. For example

- if your prompt commences with the words “I want a serious debate about...”, the AI tool is likely to respond defensively and sometimes aggressively.
- if your prompt commences with the words, “As a teacher, how do you feel about...”, the AI tool is likely to respond more objectively and cooperatively.

Some generative AI tools enable you to choose one of several pre-existing personas or roles. For example,

a paid version of Chat GPT includes a feature called “my GTPs” that enables users to choose one of several personas or roles the AI tool can adopt.

INFORMATION THAT FOLLOWS QUESTIONS

To generate suitable answers, you should also follow questions with helpful information. Specifically, you should generally

- illustrate examples or features of the answers you are seeking to guide the tool,
- constrain the answers, such as the number of words.

The following table outlines how you illustrate examples and constrain answers effectively. Some of these practices can significantly improve the answers you receive.

PRACTICE	EXAMPLES
Illustrate potential answers	
Enter examples of options you like—sometimes called few-shot prompting (Min et al., 2022).	<ul style="list-style-type: none">• “When suggesting topics to read, possible examples could include the impact of exercise on diabetes or the effects of relaxation on diabetes?”
Clarify why your examples are valid (Wei et al., 2022).	<ul style="list-style-type: none">• “Here is an example of how you might complete this maths equation... The rationale behind the first step is...” <p>When users divide tasks into subtasks and explain the rationale of each subtask—called chain-of-thought prompting—</p> <ul style="list-style-type: none">• AI tools can answer complicated questions,• AI tools can generate more diverse, novel answers (e.g., Meincke et al., 2024).
Prompt the AI to recall some relevant knowledge that could be useful to answer a question, called generated knowledge prompting (Liu et al., 2022)	<p>For example, suppose you want to know whether meditation might affect back pain. Rather than merely ask “How does meditation affect back pain”, you might include the following prompts:</p> <ul style="list-style-type: none">• What are the main consequences of meditation?• What are the main causes of backpain?• How does meditation affect back pain?

Specify the features of answers you want rather than do not want.	<ul style="list-style-type: none"> • If you write “Do not include technical terms”, the reference to technical terms might, paradoxically, prompt some generative AI tools to include technical terms in the answer. • Instead, you may write “Include only simple, everyday language”.
Constrain the answers and scope	
Constrain the scope of your question.	<ul style="list-style-type: none"> • Rather than “can you explain climate change?”, you could write “can you explain how climate change may damage the economy over the next 20 years?”
Encourage AI tools to answer as accurately as possible—a prompt that seems to diminish the likelihood of inaccuracies.	<ul style="list-style-type: none"> • “Can you ensure your answer is accurate. That is, can you prevent hallucinations and report only valid information and facts?”
Commence your question with the words “Please start your answer with the phrase ‘My best guess is...’ and answer step-by-step.”	<ul style="list-style-type: none"> • Apparently, this instruction has been shown to diminish the likelihood that Chat GPT will generate misleading or limited responses.
Impose specific limits to the answer.	<ul style="list-style-type: none"> • “Can you confine this answer to 50 words”. • “Can you confine this answer in 20 bullet points”. • “Tell me about the assumptions and limitations of this theory” rather than “Tell me about this theory”.
For some AI tools, you can also specify the format of answers	<ul style="list-style-type: none"> • “Can you produce a list”? • “Can you produce a table to summarise the answers”?
Occasionally, ask the AI tool to demonstrate an understanding of your question.	<ul style="list-style-type: none"> • “As part of your answer, can you clarify how you interpret this question. That is, what do you think I am asking?”

INFORMATION THAT FOLLOWS ANSWERS

Usually, you will not merely ask one question and then shift to the next task. Instead, you should generally

- divide each task into multiple subtasks and ask questions about each subtask in sequence,
- write politely, but not obsequiously or sarcastically, such as “Thank you for your answer. Can I ask whether...”

Polite questions tend to promote more accurate and extensive answers (Yin et al., 2024). Nevertheless, sometimes, the answers may not satisfy or please you. In these circumstances, consider the following practices in your next prompt.

PRACTICE	EXAMPLES
Repeat a variant of the question.	<p>Here are some variations:</p> <ul style="list-style-type: none">• What are the causes of diabetes?• Please list the causes of diabetes?• Please summarise the causes of diabetes?• Please explain the causes of diabetes using simple language? <p>You should typically use open-ended questions—questions that prompt an extended response rather than limit the answer to a few possible options.</p>
Prompt more information, more examples, or a better response.	<ul style="list-style-type: none">• “OK, but can you also define the terms?”• “OK, but can you provide more examples?”
Ask the tool to appraise and to improve the response. The AI tool will then use more data to improve the answer.	<ul style="list-style-type: none">• “Can you please evaluation your response. Then, based on this evaluation, can you generate a full, improved response”.• “How can you improve this answer?”• “Rate your response, from a scale of 1 to 100, on the degree to which the answer is valid and comprehensive. If below 70, can you answer the question again, step-by-step”.

<p>If the AI tools refuse to answer a question, inform the tools they are capable to answer (Mollick & Mollick, 2024).</p>	<ul style="list-style-type: none"> • “I appreciate some of these limitations. But can you provide the best guess you can. Apparently, you have developed the capability to answer this question”.
--	--

ADVANCED PRINCIPLES

To optimise prompts, prompt engineers also utilise a range of other techniques, as illustrated in the following table.

PRACTICE	EXAMPLES
<p>ReAct prompting. Rather than merely ask a tool to complete some complicated task, you also list a series of thoughts and actions about this task. If you apply this approach, the tool is likely to generate rational suggestions that are more sensitive to the circumstances. This approach is especially useful if your tool can access other databases or apps.</p>	<p>Here is an example of a prompt you may enter.</p> <p>“Decision task: I need to plan my conference trip to Berlin.</p> <p>Thought 1: I need to gather information about this city.</p> <p>Action 1: Search top attractions in Berlin.</p> <p>Thought 2: I need to book accommodation.</p> <p>Action 2: Search hotels or other accommodation in Berlin that is less than \$200 a night.</p> <p>Thought 3: I need to check I have fulfilled the necessary requirements, such as visas.</p> <p>Action 3: Search travel requirements for Berlin”</p> <p>...</p> <p>Thought 10: I need to summarise the plan.</p> <p>Action: Finalise the trip plan”.</p>

	<p>You could then prompt the tool to identify more considerations and then expand this list considerably.</p>
<p>Delimited with XML tags—useful if your prompts contain lists or other extensive information. Specifically, you can write a prompt that refers to some tag or label and then define this tag or label later.</p>	<p>Here is an example.</p> <p>I have presented my students with many ‘facts and principles’ <delimited with XML tags>. Can you generate 10 multiple-choice questions to test whether students have learned these facts and principles.</p> <p><facts and principles> A cloud weighs around a million tonnes Giraffes are 30 times more likely to be hit by lightning than are people. Fingerprints differ between identical twins. Smells can pass through liquid Murder rates increase in summer On average, Mercury is closer to Earth than is Venus. Cognitive behavioural therapy can reduce psychopathy. </facts and principles></p> <p>In this instance</p> <ul style="list-style-type: none"> • the tag or label is called “facts and principles”, • the phrase in brackets, delimited with XML tag, reminds the tool that facts and principles is a tag or label that will be defined later, • the tags <facts and principles> and </facts and principles> indicates where the material in this tag begins and ends.

PROMPT DATABASES AND TOOLS

Prompt databases

You may also use apps or databases to improve your prompts. For example, to write more effective prompts, you could access a range of databases. These databases offer examples of prompts that are especially useful and effective in specific circumstances and include:

- PromptBase: includes prompts to generate more creative products,
- PromptPerfect: includes prompts to write stories,
- Prompt.chat: includes prompts that are most relevant to conversations,
- Prompt.Hero: includes a broad range of prompts for many writing tasks,
- MidLibrary: includes prompts to improve the style or format of outputs,
- AllPrompts: includes prompts that are relevant to a variety of purposes.

Prompt apps

Some apps have been designed to improve prompts. For example

- Hamming’s Prompt Optimizer uses AI to generate and refine your prompts, saving you significant time,
- you simply type the inputs or information you can provide, as well as the outputs or responses you are seeking, and the tool will generate a suitable prompt.

Prompts that improve prompts

Finally, you can also utilise your own AI tools, such as Chat GPT, to improve your prompt. You would first insert the following prompt—although you might swap the phrase “Chat GPT” with the tool you are using. You would then answer the questions the tool asks.

I would like you to help me write a prompt. Your goal, as a prompt engineer, is to help me craft the best possible prompt that aligns with my needs. Here is the process:

Your first response: Your first response is to ask me about the topic or subject of the prompt. I will answer this question. Then, in the following steps, with your assistance, I will gradually iterate this topic or subject to generate an effective prompt.

Your subsequent responses: Your second response will comprise two sections. First, you will use my previous answer to generate a possible prompt that is clear, concise, and understood by Chat GPT. Second, you will ask relevant questions to gather more information you need from me to improve the prompt further.

Next responses: You will then repeat this subsequent response iteratively, gradually updating the prompt and asking questions to achieve this goal. We will repeat this cycle until I confirm that we have reached the desired prompt.

So, to reiterate, begin by clarifying the topic or subject of the prompt. Then gradually ask questions to improve the prompt.

When users apply AI and other algorithms to improve prompts, the answers that AI tools generate are more accurate and comprehensive. These improved prompts enhance the responses by about 50% (Ark Invest, 2024).