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HDR HELPFUL HINTS

From the Dean of Graduate Research, Simon Moss.

Uses of AI in research - developing research questions

SUMMARY

Even after they commence their degree, HDR candidates are not entirely sure of the research questions they want to pursue. They may want to sharpen their previous research proposal or even shift to another topic. Regardless of the circumstances, generative AI can help researchers formulate a feasible, compelling, and useful research question that is consistent with past research.

EXAMPLE 1: RESEARCH KICK

To illustrate, researchers could use a generative AI tool that was specifically designed to generate useful research questions to guide their research, called Research Kick. Specifically, Research Kick can generate useful research questions in a few minutes.

How to access Research Kick

To access, click [this link](#). Then

- choose “Get started” and sign up with a Google or Github account.
- purchase some credit; to illustrate, US \$2 is enough credit to generate research questions on three topics.

How to generate preliminary research questions

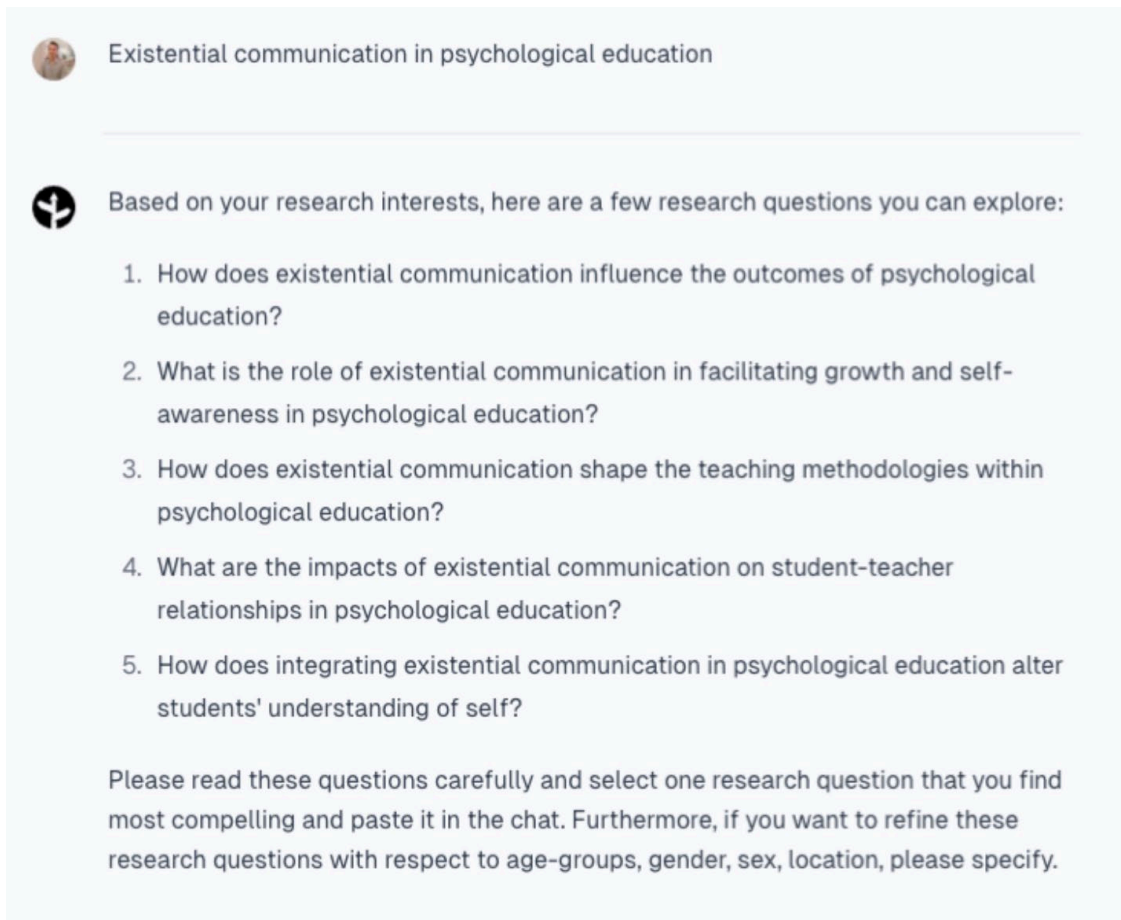
Once you can access the tool

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- Choose a database: PubMed for biomedical and life sciences; or Semantic Scholar otherwise.
- Enter some keywords that revolve around your interests, such as “communication, education, psychology”.
- The tool will then generate some preliminary research questions, as illustrated here.



The screenshot shows a chat window with a light blue background. At the top, there is a circular profile picture of a person and the text "Existential communication in psychological education". Below this, a black circular icon with a white downward arrow is followed by the text "Based on your research interests, here are a few research questions you can explore:". This is followed by a numbered list of five research questions. At the bottom of the chat, there is a paragraph of text instructing the user to read the questions carefully and select one to paste in the chat, with a note to specify age-groups, gender, sex, and location if needed.

Existential communication in psychological education

Based on your research interests, here are a few research questions you can explore:

1. How does existential communication influence the outcomes of psychological education?
2. What is the role of existential communication in facilitating growth and self-awareness in psychological education?
3. How does existential communication shape the teaching methodologies within psychological education?
4. What are the impacts of existential communication on student-teacher relationships in psychological education?
5. How does integrating existential communication in psychological education alter students' understanding of self?

Please read these questions carefully and select one research question that you find most compelling and paste it in the chat. Furthermore, if you want to refine these research questions with respect to age-groups, gender, sex, location, please specify.

How to refine the research questions iteratively

To improve these research questions, choose the most compelling and paste this research question into the chat bar to seek improvements. You can also impose specific limitations, such as specify the location or gender you want to examine. After several iterations,

- ask the tool whether the research question has been addressed in the published literature,
- the tool may also provide relevant papers that have examined this research question.

EXAMPLE 2: SCHOLAR GPT

Rather than prompt an AI tool to suggest research questions, you could instead derive research questions from your favourite papers. For example, suppose that, after reviewing the literature, you uncovered 3 publications that greatly intrigued you. You could then

- prompt a generative AI tool, such as Chat GPT, to suggest a research question and topic that combines the abstracts from these publications,
- use a specialised AI tool, such as Scholar GPT, to suggest how you could extend these publications.

Scholar GPT

Functions

- Can analyse a paper critically if you enter a pdf or URL of this publication.
- Can suggest avenues of further enquiry about a paper.

SciSpace

Functions

- Displays research trends—and these trends may help you choose topics and ideas.
- Although free, a premium version enables you to use the AI Assistant without limits and to export references to Zotero or other reference management tools

GENERIC AI TOOLS

Even generative AI tools that are not specialised for this purpose, such as Chat GPT, can help formulate and refine your research questions. Of course, although the tools might uncover some useful suggestions, you would still need to depend on your intuition and knowledge to shape, to integrate, and to enhance these suggestions. The following table illustrates how generative AI can improve your research questions

PRACTICE	EXAMPLES
<ul style="list-style-type: none">• Prompt the tool to identify controversies in the relevant literature	<ul style="list-style-type: none">• I want to conduct research that examines which personal characteristics affect the benefits of meditation to diabetes. What are

	<p>the main sources of controversy that are related to this research topic—controversies that researchers have yet to resolve?</p> <ul style="list-style-type: none"> • What are the main limitations that are related to this research topic that researchers have been unable to address?
<ul style="list-style-type: none"> • Ask the tool to help you identify a unique approach to solve these limitations or controversies 	<ul style="list-style-type: none"> • What are some novel approaches I might consider to resolve this controversy or address this limitation? Perhaps consider methods or theories that have not been applied extensively to this topic but have been applied to similar topics.
<ul style="list-style-type: none"> • Utilise the tool to extract the key recommendations of other researchers on which research topics should be explored 	<ul style="list-style-type: none"> • What have researchers identified as the main limitations in the research on this topic—and what suggestions have researchers proposed to address these limitations in future research?

LIMITATIONS

Generative AI can help you uncover novel and useful ideas. However, as research shows, these tools often recommend similar ideas to many users (Doshi & Hauser, 2023). Consequently, if you depend unduly on generative AI to generate ideas—about research or about any task—your work might not be as novel as you hoped.