



USING GENERATIVE AI FOR LEARNING, WRITING, AND RESEARCH

ChatGPT is an artificial intelligence (AI) language model that became available for public use in late 2022. Microsoft's Bing AI and Google's Bard are similar tools. NPS has released [interim guidance](#) on using generative AI tools, including language models, in academic work.

While there are limits to using AI-generated output in your work, there are also ways that you can use generative AI ethically and effectively as a graduate student. Generative AI can be a tool for learning, writing, and research—but it is essential to be aware of its limitations and approach its suggestions with caution.

Keep in mind that future changes to existing generative AI tools and the emergence of new tools will require updated guidance and recommendations. It is your responsibility to stay informed and ask questions about how and when to use these tools to support your work.

Discussion of generative AI platforms does not constitute endorsement of these platforms.

QUESTIONS?

Visit the [NPS Generative AI Teams site](#), where you can learn more about ChatGPT, Bing AI, Bard, and other emerging AI technologies.

BUILD WORKING KNOWLEDGE

Generative AI tools can help you efficiently develop working knowledge of topics and concepts. Like Wikipedia, these tools offer a first step on the path to deeper knowledge. Uniquely, generative AI tools allow you to customize your inquiries about a subject to dig deeper and to request clarification or examples.

Information literacy is critical when using generative AI to learn about new subjects. Sometimes it is acceptable to use less credible sources to develop basic working knowledge of a new topic. But often you must use highly credible sources, such as academic works, to verify what you've read, deepen understanding, and conduct research.

Be mindful: Generative AI tools regularly fabricate false information—even when they include citations in their output—and may include biased results. These tools currently have no method to highlight potentially false information or score confidence in specific statements for the user. Always treat the information as a starting point for further exploration, and never assume it is true or fair.

SUPPORT READING COMPREHENSION

You can enhance your comprehension of complex texts by asking generative AI tools to summarize challenging content using simpler terms. These tools can illuminate field-specific context or assumptions that a non-specialist reader might not initially grasp. You may interact with ChatGPT, for example, to discuss readings and explore and develop your understanding.

Be mindful: Generative AI can synthesize information but cannot offer the benefits readers derive from engaging directly with scholarly sources. Learning to decode and interpret texts in your field of study is an important part of the skill set you develop as a graduate student.

CREATE FLASHCARDS, TABLES, OR LISTS

Generative AI tools can help you quickly create tools like digital flashcards for memorization and review. For example, you can provide ChatGPT with a list of key terms and request that it format the terms with definitions and examples into a table compatible with flashcard apps like Anki.

Be mindful: Always check term definitions provided by generative AI against your course material to ensure accuracy and alignment.

TRY INTERACTIVE IN-DEPTH REVIEW

In response to well-crafted prompts, some generative AI tools can “quiz” or “interview” you about concepts or course material, allowing you to practice critical thinking and review material in an in-depth way. Try providing ChatGPT with a list of concepts, then request an interactive dialogue. Specify that it should ask you about each concept in turn, assess your response, and give feedback.

Be mindful: The confident bluster of a generative AI tool can undermine your efforts when it fabricates information about a topic you are trying to review.

UNDERSTAND ELEMENTS OF ACADEMIC WRITING

Build your understanding of academic and research writing elements by asking chatbots for overviews and examples. Tools like ChatGPT and Bing AI can offer perspectives on the characteristics of good thesis statements, effective introductions, counterarguments and rebuttals, or literature review or methodology sections, among others.

Be mindful: The specific requirements of your professor, program, department, or target publication might differ from the general advice that generative AI tools provide.

REQUEST FEEDBACK ON DRAFTS

Some generative AI tools can provide in-depth feedback on written drafts. These tools offer critiques and suggestions to improve grammar, clarity, punctuation, and argumentation. They may also identify and mark sentences where citations might be needed.

Careful prompts are necessary to ensure tools provide feedback on your text, rather than writing or rewriting it for you. When AI tools revise text, they may introduce data, reasoning, or attribution problems. Ensure that you closely review all recommendations and accept only those you judge to be helpful.

Be mindful: Never enter sensitive information of any kind into ChatGPT or other commercially available generative AI tools. Data entered into ChatGPT, for example, is never private. It can be reviewed and used by personnel at OpenAI. There are reports of bugs and breaches that may expose data to other users.

SUPPORT CODING AND DEBUGGING

You can input code snippets, ask for explanations of specific functions or algorithms, or seek guidance on debugging. ChatGPT, for example, can assist with various programming languages and offer suggestions for optimizing your code.

Be mindful: Verify the correctness and efficiency of code recommendations that generative AI offers before implementing them. Never share sensitive or proprietary code with ChatGPT or other commercial platforms, since data entered is not private.

LEARN BASICS OF RESEARCH METHODS

Learning about discipline-specific research methods is an important part of graduate school, informing the decisions you make about your own research and helping you interpret the role of methodology in others' research. Generative AI tools can offer a customized overview of methods for student researchers and clarify the characteristics of different approaches.

Be mindful: Interacting with generative AI is not a substitute for seeking guidance from your professors and advisors on research methodology. Scheduling time to discuss your work may be challenging, but failing to reach a common understanding with your faculty can lead to big (but avoidable) pitfalls.

REFINE RESEARCH QUESTION AND DESIGN

Interacting with generative AI can help you generate, refine, and scope possible research questions. It can also help you work through the potential benefits and limitations of different research designs.

GENERATE AND EXPLORE SCENARIOS AND HYPOTHETICAL CASES

Generative AI tools can generate scenarios or narratives to illustrate the application of abstract concepts, theories, or models. These tools can also generate hypothetical cases you can use to practice application of theoretical or strategic concepts.

GENERATE SEARCH TERMS AND RESEARCH TOPIC OVERVIEWS

Generative AI tools remain limited in their ability to recommend specific sources and topic-relevant authors. They are better at providing overviews of key themes and concepts in literature on a topic. They can also suggest possible gaps or limits to scholarly understanding of a given issue. Also, generative AI may be helpful in listing keywords and creating compound search terms related to a given subject.

Be mindful: Given generative AI's tendency to fabricate sources and mix and match bibliographic information, you'll need to determine if its source recommendations truly exist. The snapshot it provides of knowledge and literature on a given topic may be biased or incomplete.

SUPPORT DECISIONS ABOUT DOCUMENT ORGANIZATION

Generative AI can explain research writing conventions and help you consider options for organizing your writing. It can break down a chapter (e.g., an introduction, literature review, or methodology chapter) into a series of tasks and provide you with a checklist for completion to guide the writing process.

HELP WITH PLANNING AND TIME MANAGEMENT

If you describe your project, including time frame, hard and soft deadlines, and desired working rhythm, tools like ChatGPT can generate week-by-week plans to help you organize your efforts. Some generative AI tools can even adapt this plan to reflect information about your self-identified strengths and weaknesses (e.g., tendency to procrastinate or anxiety about sharing early drafts).

EXPLORE GENERATIVE AI AS A RESEARCH TOOL

Tools like ChatGPT can assist in designing data collection tools and analyzing research data. For example, they may be used to help draft survey instruments or code the analysis of interview responses. They can randomly generate scenarios to be used in war gaming or strategic analysis projects. Other possible uses include text classification, sentiment analysis, named entity recognition, text summarization, language translation, code generation, and code annotations.

Be mindful: Discuss the potential or anticipated uses of generative AI fully with advisors. Because of the novelty of generative AI tools, implications of their use in research methodology should be considered with care. Maintain a record of how you used the tools and how their use influenced your research process and outcomes. Any aspect of research methodology (including use of generative AI) should be discussed in your work.