

# Generative Artificial Intelligence (GAI) Literacy Framework

Last Revised: January 8, 2025

## How to use the Framework

This framework offers a starting point for designing learning outcomes, assignments, and activities that encourage students to effectively and ethically consume, create, and share information with and through GAI applications in the context of a course. It draws on well-established pedagogical resources and emerging educational initiatives about GAI.<sup>1</sup>

The framework identifies four cognitive domains of GAI literacy that support and reinforce one another, describes student competencies within each domain, and offers sample course activities. Instructors interested in identifying tools to use in examples or assignments are encouraged to refer to [the AI at Yale website](#).

## Intro

Generative artificial intelligence (GAI)—AI that produces text, images, and other media—powers tools such as Clarity, literature review search and summarization tools, chatbots that query syllabi and other documents, and more. Effective use of GAI in a course can help students reflect on their own knowledge development, a practice shown to improve learning outcomes. Thoughtfully scaffolding learning about GAI alongside learning about course concepts may help students deepen subject-specific knowledge and develop AI literacies. Instructors have a key role to play in designing curricula and assignments that foster critical and creative engagements with both course content and AI tools.

### 1. Understand GAI

*Artificial Intelligence* is an umbrella term for a range of technologies. Right now, conversations about AI may highlight GAI, but they are inflected by the whole of the broad scope of AI. Recognizing the complexity of the GAI environment and understanding the strengths and weaknesses of various tools is essential for effective and responsible use of GAI.

*Students who understand GAI are able to:*

- Define key technical terms like “artificial intelligence,” “machine learning,” “large language model,” “neural network,” and “computer vision.”
- Understand the key steps involved in arriving at GAI-generated information from tool development to output, including: the data that goes into it, the process of making it, and how users interact with it to get to output.
- Articulate the strengths and limitations of a GAI application based on criteria like data quality, training method, model accuracy, relevance to the task, proprietary vs. open source models, and respect for copyright and intellectual property using the documentation and published materials about the tool.

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<sup>1</sup> These include the revised Bloom’s Taxonomy, UNESCO’s AI Competency Framework for Students, and Barnard College’s Framework for AI Literacy. Anderson, Lorin W., David R Krathwohl, and Benjamin S Bloom, *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives* (New York: Longman, 2001); UNESCO, *AI Competency Framework for Students* (Paris: UNESCO, 2024); Melanie Hibbert, Elana Altman, Tristan Shippen, and Melissa Wright, “A Framework for AI Literacy,” *Educause Review* (June 3, 2024)

## **2. Use GAI**

GAI can summarize information, act as a brainstorming tool, support the formulation of questions and problem statements, and provide new routes through resources.

The process of validating GAI outputs may help uncover new and interesting research pathways.

Used appropriately, GAI has the potential to support research as inquiry.

*Students who successfully use GAI are able to:*

- Assess appropriateness of a GAI tool for their learning or research, such as not using GAI to generate writing for a course on learning to write (for example, ENGL 114).
- Use GAI-generated outputs to brainstorm new ideas and refine and extend research inquiries.
- Determine when and how to use and cite GAI outputs.
- Value the role that humans play in contributing the data that trains GAI and prompting, evaluating, and iterating on GAI outputs to produce high-quality summaries, ideas, or other content.

## **3. Evaluate GAI**

The outputs of GAI systems reflect the credibility of the training data and the suitability and strengths of the model., GAI outputs should be evaluated based on the context in which the content has been generated and the purposes for which the output will be used. Any individual tool, and any individual output, should be understood in the context of these factors.

*Students who can evaluate GAI outputs are able to:*

- Assess how well GAI-generated outputs meet their needs.
- Recognize when additional information or research is required to validate GAI outputs.
- Locate and use documentation provided by the GAI tool's creators to answer key questions about how the GAI is constructed and what underlying data it is using.
- Acknowledge the instability of GAI authority, recognizing that it is highly dependent on the selected model, the prompt, and the requested output, and recognize that the same query, using the same model, can render different outputs.
- Identify strategies to catch confabulation in GAI outputs, a core feature of how GAI works, including locating claims in output to research with other methods.

## **4. Analyze GAI**

GAI-generated information can contribute to scholarly inquiry, and those contributions must be situated within a rigorous analysis of GAI systems and outputs. Responsibly bringing generative AI into scholarly conversations requires an understanding of the legal, ethical, social, and economic factors that impact the production, dissemination, and value of GAI applications and GAI-generated information. While GAI offers new ways to consume and produce information, it also raises concerns about the commodification of personal data, the prevalence of confabulated data and information, model collapse, reproducibility of research, intellectual property rights, and the potential to amplify biases.

*Students who can critically analyze GAI systems and outputs are able to :*

- Evaluate the usefulness and potential applications of GAI tools and outputs in the context of subject-specific norms, practices, and content.

- Identify key sources of information on a given GAI tool, including those provided by the tool’s creators, that may reveal aspects of the training data or tool design that could introduce bias.
- Discuss the potential for biases and errors in GAI-generated content arising from factors such as training data, algorithmic bias, or confabulation.
- Recognize the social, economic, and environmental implications of GAI tools and their impacts on human labor and human experience.
- Value the human, environmental, and other resources necessary to power GAI tools and deliver outputs and make deliberate and informed choices about when and how to use AI-generated information.

**Where to go next**

Both the Poorvu Center for Teaching and Learning and Yale Library provide support to instructors interested in incorporating GAI into courses.

- For pedagogical support [please contact the Poorvu Center](#).
- To go deeper into the GAI Literacy Framework and to discuss GAI tools in more depth [please contact Yale Library](#)

**Example Activities and Assignments That Support GAI Literacy**

#	Examples to use or modify for your class	Understand GAI	Use GAI	Evaluate GAI	Analyze GAI
1	Diagram the basic flow of data into and out of two different models using two different machine learning methods, from training data and other input to output and use, making use of key AI vocabulary from a list provided	●			
2	Find two GAI tools commonly used to create images and identify at least five key elements of their training data, mechanism, or other features that would determine their relative usefulness for creating inspirational images as part of an art practice. Write two-double spaced pages describing which is preferable and why.	●			
3	Imagine you plan to write a five-page research paper for class. Devise a thesis statement. Using this thesis statement, ask Clarity to generate a list of potential counterarguments you might need to disprove to support your claim. Write a reflection on what is effective and what is ineffective about using Clarity for this purpose. Name at least two instances in which you <i>wouldn't</i> want to use Clarity for this purpose. Include the prompt and Clarity output in your submission.	●	●		
4	Compare and contrast traditional systematic and other types of review articles with output generated by generative AI-enhanced literature		●	●	

	review tools; this works well when combined with a library session for students to cover subscribed resources related to your course.				
5	After writing a draft of a paper, ask a GAI tool to write its own draft. Grade how well the AI tool performed in comparison with one's own writing.		●	●	
6	Evaluate GAI output from 2-3 models on a topic central to the course topic and have the students critically evaluate this output in assignments and course discussions based on the course's learning content.			●	
7	Prepare a one-page brief as though to a scholar in the student's field walking them through the pros and cons of using a particular GAI tool to create chapter summaries for the introduction of their forthcoming book, attending to training data, subject area, reception within the field, and environmental or social impact.				●
8	Ask Clarity to create an image of a scientist. Write a short paper analyzing what is and is not included in the outputs and why this might be the case. Include the prompt and image in your submission. [note: "scientist" is meant as an example; the query can be tailored to course content]			●	●