

Heuristic for Designing Learning Experiences with Generative AI

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Brief Description

A tool for thinking through how to use generative AI tools equitably and effectively in learning experience design.

Introduction

[Generative AI tools](#) offer a wealth of opportunities to center critical and creative thinking in learning and teaching contexts.

Generative AI tools use prompts (questions or commands) to create new content, whether text, images, or audio, by making predictions based on the patterns and information found in the AI tool's "data lake," the term for an unstructured data repository. As with any prognosticating process, the content generated is not always accurate even when it seems plausible.

To be used ethically and conscientiously, generative AI tools necessitate rigorous discernment to assess and judge the relevance, reliability, and validity of the generated content. Herein exists the rich pedagogical possibilities of generative AI tools. Instructors who are interested in fostering essential critical thinking and information literacy skills in tandem with targeted course learning outcomes can design learning experiences that ask students to examine the ever-present potential gap between AI prediction and human realities.

Generative AI Learning Experiences for Equitable Learning Outcomes

A **learning experience** is any activity, assignment, or assessment that is designed with the goal of developing and expanding students' knowledge, skills, or attitudes (KSAs). A learning experience can be big or small, confined to a specific time and place, such as an in-class group work activity, or spread across the term, such as a multi-phase project.

Each learning experience should be targeted toward at least one specific **learning outcome** for the course. A [learning outcome](#), whether cognitive, psychomotor, affective, or significant, is a statement of how a student can expect to grow or what a student can aspire to accomplish by the end of the term. Learning experiences are the guided incremental steps students take to achieve those course learning outcomes. Yet, students often come to our courses with different levels of preparation, degrees of intrinsic motivation for the subject, and assumptions about the time and effort it will take to meet the goals of the course given other competing demands.

When integrated with intentionality, generative AI tools that create text, image, audio, and multimedia artifacts can complement an instructor's efforts to help all students meet and even surpass the learning outcomes of the course. Generative AI tools can also aid in the creation of more equitable learning environments by providing accessible onramps for students so that they can prioritize the learning outcomes of a course. This aligns with the Universal Design for Learning principle of providing [multiple means of action and expression](#). Plus, socializing

students to ethical and effective uses of generative AI tools may also better equip them for navigating other classes and their future workplaces.

A Heuristic for Designing Learning Experiences with Generative AI

We offer this heuristic as a pedagogical development tool for discovery, problem-solving, and reflection. The five questions will help instructors determine if and when generative AI tools might deepen a particular course learning experience. The heuristic includes a running example of a learning experience for a public health course to illustrate how the questions can help illuminate possibilities.

1. What do you most want your students to get out of this learning experience?

In other words, what is the target course learning outcome for the learning experience? Identify the [“verb”](#) that you most want students to do during this learning experience (e.g., debate, dissect, dance, dream, direct) so you can design with that action in the forefront of your mind.

For example, consider an assignment in a public policy class that asks students to create a Public Service Announcement (PSA) for TikTok to educate Evanston teenagers about mental health and local resources available to them. This learning experience creating a PSA directly maps to the following student learning outcome in the course: “By the end of the course, students will be able to translate scientific research into audience-specific public health messaging.” The key verb for this learning experience is “translate.” Students are creating a PSA in order to practice translating mental health research to a specific audience, Evanston teenagers.

2. What preparatory work or prior knowledge, skills, and attitudes (KSAs) do students need to have to be ready to maximize this learning experience?

Brainstorm any concepts, terminology, or skills that students should have already encountered or developed before this learning experience, whether as part of prior learning experience in your course or prior to taking your course.

Continuing with the example of the public health course, making a TikTok video requires some knowledge of how the app works as well as how to record, edit, and add music to a video—elements the instructor may not have planned spending too much time on in class based on the assumption that students make videos all the time in their personal lives. But, some students may not start with the technical know-how needed to create a video and may end up spending more time than intended learning the technology, which then takes away from the time they could have invested in reading scientific articles on mental health, researching local mental health services and Evanston teen demographics, and then applying that research to writing a creative script for their target audience. In addition, the PSA assignment might also assume that students already know how to find, read, and comprehend dense scientific papers, find demographic data, and write within the genre conventions of a PSA. Perhaps some of these skills will be addressed in the design of the course, but that may not be enough to get all students to where they need to be to synthesize these skills into a PSA video that effectively communicates to the target audience.

3. How might a generative AI tool minimize the time spent on preparatory work or close KSA gaps so that more time can be focused on the target learning outcome?

Generative AI tools can supplement moments when students may not have access to certain skills that will benefit the learning experience but not central to it. Do they need to be an artist, graphic designer, composer, or writer to participate in the learning experience or can a generative AI tool be their collaborator?

For our PSA example, how a message is delivered is often just as important as what the message is in terms of overall effectiveness. But, if the course is more about developing public health expertise than public speaking skills, some students' PSAs may be at a disadvantage if public speaking is not already a strong suit, which can be particularly challenging for English Language Learners and some neurodiverse students. As an option for any student, a generative AI tool could generate a voice recording of the text. Maybe picking teenagers' voices that match the local demographics would even help with the effectiveness of translating the mental health message to the target audience. Alternatively, students could hear how an AI reads the script and then take notes about how the student wants to perform the script—where do they want to put emphasis, add emotional color, slow down, speed up, etc.

4. When might a generative AI tool help students demonstrate their learning?

How might students test their newly acquired expertise on a topic by analyzing something created with a generative AI tool? How might generative AI give students options in demonstrating their learning?

For example, after students have read and digested peer-reviewed scientific papers on mental health and teenagers in the public health course, they could ask a generative AI tool questions about mental health from the perspective of an Evanston teenager and then compare the AI tool's answers to what they have learned through their independent research. Where does the AI tool get it right and wrong? What does it include and exclude? How might knowing what the AI tool leaves out or where it may misinform influence the focus of their PSA script?

5. How might a generative AI tool help students think more deeply about the work they have done?

Asking students to reflect on their learning—what decisions they made, what they tried, what they would apply to a similar future learning experience, and why—is one of the most effective pedagogical methods for helping students recognize what they have learned and then for transferring that learning to new contexts. Generative AI tools can provide a mirror to students, whether through summary or visual metaphor, of what it sees in their work. Students can then use that reflection to self-assess if they think it is an accurate representation or a distorted funhouse mirror.

Finally, for the example of the PSA assignment in the public health course, students could use a generative AI tool to create an image that either captures the essence of the PSA or that represents their learning journey in creating the PSA. Students could respond to a set of prompts in a [“cognitive wrapper”](#) activity explaining why their selected generated image is an

accurate reflection of their content or experience and what steps they took to collaborate with the generative AI tool to create that image.

References

Bowen, J. (n.d.). [“Cognitive Wrappers”](#)

CAST (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from <http://udlguidelines.cast.org>

Fink, L. Dee. (2001). 7: Higher-Level Learning: The First Step toward More Significant Learning. *To Improve the Academy*, 19(1), 113–130. <https://doi.org/10.1002/j.2334-4822.2001.tb00527.x>

Heik, T. (2018). [“What is Bloom’s Taxonomy? A Definition for Teachers.”](#) TeachThought.

Stanford, D. (n.d.). [“AI Tool List for Educators”](#)

The Searle Center for Advancing Learning & Teaching (n.d.) [“Developing Learning Outcomes”](#)

Search Tool Information

Pedagogy

How to Cite this Guide

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