

Questions for Integrating AI Chatbots into Classes

MEHP Online and the Master of Health Care Innovation see artificial intelligence as an enormous opportunity to enhance student learning and engagement. However, we also believe that it must be approached with due deliberation to ensure that our specific uses of the technology do in fact have a positive impact.

To help achieve that balance, here are some guiding questions intended to spur informed discussion about when—and whether—it is appropriate to deploy chatbots like AI tutors and teaching assistants in classes.

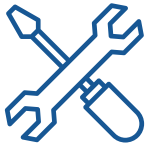
You do not need answers to all of these questions *before* deploying a chatbot with students. However, it is important to have thought about them so that when they come up, you can address them nimbly, without hitting pause on learning.



PEDAGOGY

How an AI chatbot might enhance student learning in your course, and whether pedagogical gains outweigh potential drawbacks.

- **How can the AI chatbot advance student learning in this course and in this activity?**
 Consider the learning objectives of the course and the types of engagement you expect from students. Consider what a chatbot might add that you and your students could not easily achieve a different way.
- **Is there existing evidence that this is an effective use of a chatbot?**
 For example, there have been several studies of the value of AI chatbots as tutors in STEM fields. Check the literature to see if other groups have tried your idea, and how it went for them.
- **If not, what makes you think that this may be a good use of a chatbot?**
 It is still early days for evidence of the value of chatbots in education. Are there analogues elsewhere that might suggest that your use will be effective—or not? Do you have an intuition that you would like to test?
- **What are the possible negative pedagogical consequences of implementing a chatbot?**
 For example, chatbot tutors might make students overconfident in their skills and lead them to underperform in situations where they do not have the chatbot for support. Or the chatbot might benefit high achievers disproportionately.
- **What are the possible negative pedagogical consequences if the chatbot acts in unexpected ways and/or returns false information?**
 For example, [LLMs are notoriously bad at math](#). What if students ask for math help and get wrong answers or false methodologies for problem solving?



TECHNICAL

The tools you will need to get a chatbot up and running, how it integrates into courses, and the time and effort needed for setup and maintenance.

- **What platform will you use to implement the chatbot?**
For example, some professors set up custom GPTs using ChatGPT's premium tier; there are also a number of ed tech tools—like [Ed Discussion](#)—that include chatbot features as an option.
- **Does the chatbot integrate into your learning management system (LMS)?**
Will students be able to access it seamlessly by logging in through the LMS? Can chatbot interactions be embedded into existing discussion forums? Can activities be easily graded?
- **To what degree will the platform add extraneous cognitive load to students' course experience?**
Extraneous cognitive load is effort spent on a course that is put into activities other than learning. Consider, for example, how much effort it will take your least tech-savvy student to access the chatbot. Consider whether students will need to spend time and effort creating a separate account to access it.
- **Will students (or the program, on students' behalf) need to pay to access the chatbot?**
If students need a premium account with an AI company, that can be quite expensive. For example, ChatGPT's premium tier is \$20/month as of November 2024. What happens if a student cannot afford the fee?
- **What time, effort, and resources will it take to set up the chatbot?**
How long will it take you as an instructor to set up the chatbot? Will you need to engage IT for extra help? How much testing will be required to make sure the chatbot acts appropriately? If you plan to provide it with additional documents—like, for example, through [Retrieval Augmented Generation \(RAG\)](#)—how much time and effort will it take to create and optimize those materials?
- **What if you need to migrate the chatbot?**
There are many reasons why you might need to deploy a chatbot on multiple platforms. To facilitate portability, consider creating all prompts and training materials in a separate file that can be reused later on.



STUDENT SUPPORT

How you will help students interact with the chatbot effectively, and how you will monitor and moderate chatbot outputs.

- **What help materials will you need to build or curate for students to use the chatbot effectively?**
Interacting with chatbots effectively is not intuitive, and best practices for interacting with a purpose-built chatbot like a tutor may not be the same as interacting with a general-purpose bot like ChatGPT. What documentation will you create or curate to help students get the most out of chatbot conversations?
- **Will you need a human in the loop for your chatbot? If so, before or after chatbot answers are visible to students?**
If chatbot output needs to be accurate or consistently on topic, it may be best to have a human review its interactions with students. Is this something you will need to do? If so, will you use a comment moderation model, where you or a member of your team reviews chatbot outputs before students see them? Or will you use a factchecking model where you correct any inaccuracies after the fact?

- **How will you handle chatbot inaccuracies in student assignment submissions?**
Even the most advanced LLMs are [subject to “hallucinations” and reproduce biases embedded in their training data](#). Will students be responsible for ferreting out and correcting those inaccuracies? If so, make that requirement explicit in your course policies and assignment directions.



PRIVACY

What information the chatbot might collect from you and your students, and whether those terms are acceptable for a classroom activity.

- **What information are you and your students sending to the LLM running the chatbot?**
Companies like OpenAI and Google may collect chat transcripts and use them to train their models. They may also collect personally identifiable information like email addresses and location. Consider whether your students will be inputting information that is proprietary or sensitive. And especially consider whether the chatbot might collect information that is legally protected by FERPA or HIPAA. If you are unsure, *consult your institution before you create and deploy the chatbot!*
- **Does your institution have a contract limiting how the vendor can use information?**
Enterprise contracts may constrain how the LLM provider can use the input information. Does your institution have such a contract? If so, what are its terms? If not, what are the risks?



RESOURCE EXPENDITURE

Whether learning outcomes are worth the time, money, effort, and environmental impact required to run a chatbot in your classroom.

- **What will it cost to give students access to the chatbot?**
As stated above, if access to premium services is required, the cost can be substantial. Will the institution pay for access? Will students be expected to buy access? What if a student cannot afford it?
- **What will it cost to create and test the chatbot?**
Consider the cost of development, whether you will need to hire and pay an outside contractor, how long development will take, and the cost of access to the LLM prior to the course for development and testing purposes.
- **Are the advantages of the chatbot worth the resource consumption and climate impact?**
The LLMs that power chatbots [consume substantial amounts of power and water](#) and may be significant contributors to our global carbon footprint. Consider whether your use case adds enough value to student learning that it is worth the expenditure in this area.