

# Using AI to Implement Effective Teaching Strategies in Classrooms: Five Strategies

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Generative AI large language models such as ChatGPT can help instructors implement teaching strategies that have been shown to improve student learning but can take some effort to put into practice. Examples are provided below for five evidence-based strategies. Keep in mind that your subject matter and teaching expertise are needed to assess the AI's output and gauge whether and how each technique should be put into practice within your course.

## Strategy 1: Producing Many Varied Examples

Producing many examples of one concept is quick work for an AI. You can choose the best examples from the AI's output.

Here is how:

1. Pick a concept you want to make sure students to understand well
2. If using an AI connected to the internet (such as Microsoft Copilot): Tell the AI to look up that concept using core works in the field
3. Tell the AI what you need (I am a university professor and I need many and varied examples of this one concept)
4. Describe the style of writing you prefer (clear, straightforward, concrete, dynamic, engaging)
5. Describe your audience (my students are college students who haven't heard of this concept before)

Carefully assess the AI's output. Be iterative – it may take several attempts to refine your prompt. It may be worthwhile to engage the AI in conversation to produce different examples or focus on a particular theme.

To gauge whether or not the AI's output is of value and should be used in class, you can consider the following questions:

- Are the examples relevant?
- Are they factually correct? It is possible for the examples to be subtly wrong and thereby teach the wrong lesson.

- Do the examples have enough detail?
- Will they interest students?
- Are they varied? That is, do they approach the concept from a variety of different perspectives and frameworks?
- Can they serve to connect the abstract (concept) to the concrete (real-life application)?
- Does it align with your learning objectives?

## Strategy 2: Providing Multiple Explanations

Producing many examples of a single concept can be a complicated task. AI can help by generating multiple explanations from a variety of perspectives, by incorporating a step-by-step approach and by adding details to any existing explanations. If students are confused, the AI can produce a simpler summary of the concept that may help students grasp the topic. Instructors can also give the AI their current explanation of a topic and ask the AI to simplify it, add more examples, or explain it using a step-by-step approach.

Here is how:

1. Pick a concept you want to explain
2. If using an AI connected to the internet (such as Microsoft Copilot): Tell the AI to look up that concept, using core works in the field
3. Tell the AI what you need (a clear multi-paragraph explanation of a topic )
4. Describe the style of writing you prefer (clear, straightforward, concrete, dynamic, engaging)
5. Describe your audience (my students are college students who haven't heard of this concept before)
6. Follow up the initial prompt by asking for analogies

It is important to assess that explanation and make sure that it is both factually accurate, adapted to the right level for students, and can augment teaching. To do so, you can consider the following questions:

- Is the explanation clear and consistent, in language that is unambiguous and easy for students to understand?
- Does it focus on the most critical parts of the topic(s)?
- Is the explanation factually correct?
- Is the explanation adapted to student learning levels? (Note: You can work with the AI to simplify any explanation it generates.)
- Is the explanation coherent and engaging, and will it be helpful to students?
- Does the explanation connect to the prior knowledge students may have about a topic? (Note: You can ask the AI to include specific ideas or make a connection to a previous topic.)

## Strategy 3: Developing Low-Stakes Tests/Quizzes

Low-stakes, frequent tests are an effective learning strategy, providing students with active retrieval practice and feedback on their understanding of the material. AI can help create multiple choice or short answer quizzes and answer keys, which can be used in or outside of class. Share with students that this is an opportunity to practice and clear up any confusion about what they are learning.

Here is how you can do this:

1. Define the AI's role. In this case, the role assigned to the AI is creator of diagnostic quizzes.
2. Inform the AI of the topic you want to teach and the teaching strategy you want to pursue (low-stakes test to assess student knowledge).
3. If there is a publicly available document or online article you have assigned as a reading, write the article(s) into the prompt.
4. You can also give it directions about the types of multiple choice questions it should produce; for instance, multiple choice questions should include plausible, competitive alternate responses and should not include an "all of the above option."
5. Check its output; you may need to work with it to develop factual and higher-order questions.

Review the output to make sure it is factually accurate and adapted to the right level for their class.

Multiple choice tests must be carefully worded and include plausible alternatives to the correct response. These alternatives can be challenging to generate because they should be attractive to students with incomplete understanding and should be based on common misconceptions students have about the topic.

Similarly, short-answer questions must be straightforward, unambiguous, and should not be open to interpretation. If the AI also generated a scoring rubric or provided the correct response, check to make sure that the responses the AI notes as "correct" are in fact correct.

## Strategy 4: Assessing Student Learning

The classroom assessment technique ["1 minute paper/muddiest point exercise"](#) can help instructors and students monitor their learning and understanding of the course material by asking students to summarize and interrogate their knowledge and identify areas of confusion. AI can be helpful in quickly summarizing students' responses.

Here is how:

1. Create a Google Doc or other shared document and ask students to submit their responses to questions such as "what was the most important idea or concept covered in class today" and "what did you struggle to understand"?

2. Submit the responses to the AI with the following prompt: I am a teacher who wants to understand what students found most important about my class and what they are confused by. Review these responses and identify common themes and patterns in student responses. Summarize responses and list the 3 key points students found most important about the class and 3 areas of confusion: [Insert material here]

To evaluate the output, check for common themes: do these align with your teaching goals for the class? Can most students explicitly name and explain the key ideas? And check for common points of confusion. Are these typical gaps that you have seen before?

If the AI's output matches your expectation, you can adjust your teaching approaches to address these issues. Check the student responses if the AI's output does not match your expectations or you are surprised by what you uncover.

## Strategy 5: Distributing Practice of Important Ideas

Students need to practice retrieving information they are learning not just once, but multiple times throughout a course. Introducing new topics and giving students practice with previously learned topics is critical but time-consuming and requires that the instructor take time to design and schedule practice opportunities. AI can be helpful in creating distributed practice to review a topic after a week, a month, and then at the end of the semester.

Here is how:

1. Ask the AI to generate questions to test student knowledge about a series of course topics across the course timeline, incorporating and testing students on new and previously learned concepts.
2. Ask the AI to find a relationship between concepts to find a variety of ways to connect both ideas in the classroom. The AI can also follow up with specific questions to prompt students to retrieve previously learned concepts.

Sample prompt: I would like you to act as a short answer quiz generator for students. When students distribute practice across a course and revisit previously learned topics, the practice helps them remember and understand these topics. I would like you to ask me for a syllabus schedule that includes a week-by-week schedule of topics with a brief description of each. I would like you to ask me what level of students I am teaching. You will look up the course and the concepts in the course, and then provide me with 3 quizzes that include 2 short answer questions and 2 multiple choice questions that test students on new and previously learned topics and that connect the topics. You'll need to include topics learned in earlier weeks in the quizzes of later weeks. Tell me when I should use each quiz in my class.

To evaluate the output, consider the following:

- Check its facts and consistency. The AI may point out new connections and it may point out connections exist but aren't critical.
- Are the quizzes too difficult or too simple, and do they assess what is most critical for students to know?
- Will they help students connect new and old information?
- Are they suitable in terms of prior knowledge and time frame, and are they realistic and manageable from a teaching perspective?