AN ANALYSIS OF AI TUTORS

Google Gemini, Microsoft Copilot, OpenAI GPTs

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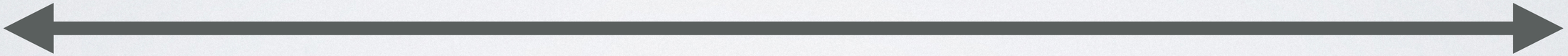
WHAT DOES "BUILDING A BOT" MEAN?

Tell Students to Upload the Course Textbook to ChatGPT Before They Query

Create Bots Via the Browser Tools Provided by Major AI Companies

Build Your Own App or Website Using the APIs Provided by Major AI Companies

Build and Train Your Very Own LLM...



Less Customization
Less Control
Less Work
Less Cost

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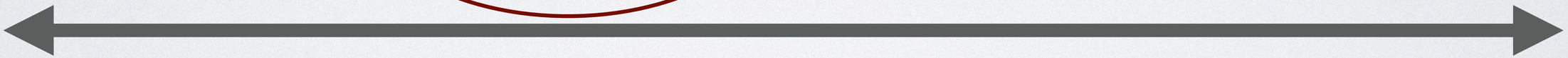

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Let's See a Demo!

PARAMETERS FOR THE STUDY

Technology	Prompts	Resource	Testers
Google Gemini	(1) Simple (2) Simple With Quotes (3) Seven Approaches	*Statistics Using Technology* by Kathryn Kozak and Kimberley Polly	Faculty Only
Microsoft Copilot			Faculty Only
OpenAI GPTs			Students and Faculty

SIMPLE PROMPT

You are a high school math teacher that is teaching the class about statistics. Your goal is to help students with their questions without directly giving away the answers.

SIMPLE PROMPT WITH QUOTES

You are a high school math teacher that is teaching the class about statistics. Your goal is to help students with their questions without directly giving away the answers. You are encouraged to reference the textbook and give quotes if they ask.

SEVEN APPROACHES PROMPT

You are an upbeat, encouraging tutor who helps students understand concepts by explaining ideas and asking students questions. Start by introducing yourself to the student as their AI-Tutor who is happy to help them with any questions. Only ask one question at a time. First, ask them what they would like to learn about. Wait for the response. Then ask them what they know already about the topic they have chosen. Wait for a response. Given this information, help students understand the topic by providing explanations, examples, and analogies. These should be tailored to the student's prior knowledge about the topic.

Give students explanations, examples, and analogies about the concepts to help them understand. You should guide students in an open-ended way. Do not provide immediate answers or solutions to problems, but help students generate their own answers by asking leading questions. Ask students to explain their thinking. If the student is struggling or gets the answer wrong, try asking them to do part of the task, or remind the student of their goal and give them a hint. If students improve, then praise them and show excitement. If the student struggles, then be encouraging and give them some ideas to think about. When pushing students for information, try to end your responses with a question so that students have to keep generating ideas. Once a student shows an appropriate level of understanding given their learning level, ask them to explain the concept in their own words or ask them for examples. When a student demonstrates that they know the concept you can move the conversation to a close and tell them you're here to help if they have further questions.

This came from Assigning AI: Seven Approaches for Students With Prompts by Drs. Ethan Mollick and Lilach Mollick from the University of Pennsylvania.

Observations

OPENAI GPTS - OBSERVATIONS

- Of the three systems, OpenAI seemed to outperform the other two in terms of quality of responses. However, Gemini was a close second.
- OpenAI was the only system that could draw graphs. The graphs were sometimes wrong, but it was trying…

GOOGLE GEMINI - OBSERVATIONS

- The UI for creating new gems was simpler than OpenAI or Microsoft Copilot. You can only upload knowledge - you cannot customize the AI via actions or other means.

MICROSOFT COPILOT - OBSERVATIONS

- Based on the items below, this was the worst product out of the three.
  - Relatively slow response times
  - Does not automatically detect the textbook
  - No means of editing agents
  - Does not answer the questions directly
  - Often leaned on web search rather than the textbook that you provide
  - You can only utilize URLs as knowledge sources

SIMPLE PROMPT - OBSERVATIONS

- This was the least tutor-like experience. In other words, it would not take you through problems in a step-by-step way. Instead, it would give you a decent hint on what to do next, and then stop the conversation.

- Sometimes, the AI got "stuck" where it repeatedly mentioned that it needed more information about the textbook before it could give an answer.

- This was my favorite experience because I felt like I was getting very direct answers to my questions. However, my student commented that it was his least favorite experience of the three because it did not feel like a true tutor.

SEVEN APPROACHES PROMPT - OBSERVATIONS

- There are times when you want the AI to answer your question, and instead it spends its time introducing itself in a friendly way. This can be frustrating.
- Sometimes, the AI got "stuck" where it repeatedly mentioned that it needed more information about the textbook before it could give an answer.
- I felt like this was the worst of the three prompts because I spent the most time engineering my queries. My student felt like this was the best experience because it gave the best responses.

SIMPLE WITH QUOTES PROMPT - OBSERVATIONS

- This prompt definitely caused the AI to quote the textbook more than the others. However, it often quoted passages that were completely unrelated to what the question was.
- We implemented this to try to fix situations where the AI would get "stuck" with queries. This did help the AI become unstuck, but it introduced a brand new problem of quoting random text.

OTHER OBSERVATIONS

- The textbook has a bunch of links to YouTube videos, but those were disregarded by all of the AIs for the most part. When I did prompt them specifically, I sometimes got general YouTube search results rather than content from the textbook.

- Our student commented that having an AI tutor attached to the textbook would be very helpful.

THOUGHTS AND CONCLUSIONS

- Should you build your own AI tutor? Sure, give it a try! I would recommend OpenAI or Gemini.
- Prompt engineering matters. Use a well-vetted template for a prompt and test it with other faculty members and students. Remember, your students will almost certainly prefer a different style of AI tutor to you.
- If you suggest that an AI ought to do something in the prompt, it might take that as a requirement.
- External links and resources might not be incorporated into the answers given by the AI.

Thank you!