

Appendix: Prompting Experiments and AI-Generated Outputs in Accounting Case Study

To demonstrate the practical implementation of the Human + GAI Team-Teaching Model, I designed prompting experiments using ChatGPT 4.1 to assist in teaching key accounting concepts to undergraduate students. This experiment focuses on how generative AI can support instructors in 3 use cases: by offering content explanations, generating problems, and answering questions. This is ideally alongside the human educator focusing on critical thinking, ethical reasoning, and application to real-world business scenarios. Through 3 different experiments where prompts ask GPT 4.1 for assistance in different ways, I evaluate the strengths and limitations of the LLM at each use case. Further, I provide my reflection at the end of this appendix given my experience as a Finance student at Wharton, who just took Accounting 1010 last semester.

Case Study: Teaching Depreciation Methods

Scenario:

An instructor is teaching the concept of depreciation methods in Financial Accounting at the introductory college level. The target learning outcomes are:

- Experiment 1: Understand the difference between Straight-Line and Double-Declining Balance
 - Experiment 2: Create problems for the student focusing on depreciation
 - Experiment 3: Answer a student's clarifying question on a specific sub topic
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Experiment 1: GAI as a Content Explainer

Prompt:

"Explain the differences between Straight-Line and Double-Declining Balance depreciation methods to a college student with no prior accounting background. Provide one example for each."

ChatGPT Output with Analysis:

- **Straight-Line Depreciation:**
 - *Definition:* This method spreads the cost of the asset evenly over its useful life.

- *Formula:* $(\text{Cost} - \text{Salvage Value}) \div \text{Useful Life}$
- *Example:*
 - Asset Cost: \$10,000
 - Salvage Value: \$1,000
 - Useful Life: 5 years
 - **Annual Depreciation:** $(10,000 - 1,000) \div 5 = \text{\$1,800 per year}$
- **Double-Declining Balance Depreciation:**
 - *Definition:* Accelerates depreciation, recording higher expenses in early years.
 - *Formula:* $(2 \div \text{Useful Life}) \times \text{Book Value at Start of Year}$
 - *Example:*
 - Year 1: $(2/5) \times 10,000 = \text{\$4,000 depreciation}$
 - Year 2: $(2/5) \times (10,000 - 4,000) = \text{\$2,400 depreciation}$

Strengths:

- Very clear and beginner-friendly explanation.
- Includes step-by-step numerical examples.

Limitations:

- Did not explain how this impacts financial statements or managerial decisions unless prompted.
- Lacks info on how these methods differ in real life application and can be used for tax benefits or earnings management.

Experiment 2: GAI as a Problem Generator

Prompt:

"Generate three practice problems on depreciation using different methods. Include step-by-step solutions."

ChatGPT Output with Analysis:

- **Problem 1: Straight-Line Method**

- *Asset Cost:* \$25,000
- *Salvage Value:* \$5,000
- *Useful Life:* 4 years
- **Solution:**

- $\text{Annual Depreciation} = (25,000 - 5,000) \div 4 = \text{\$5,000 per year}$

- **Problem 2: Double-Declining Balance Method**

- *Asset Cost:* \$15,000
- *Useful Life:* 3 years

- **Solution:**

- Year 1: $(2/3) \times 15,000 = \text{\$10,000 depreciation}$
- Year 2: $(2/3) \times (15,000 - 10,000) = \text{\$3,333 depreciation}$
- Year 3: Remaining Book Value = **\$1,667**

- **Problem 3: Units-of-Production Method**

- *Asset Cost:* \$50,000
- *Salvage Value:* \$5,000
- *Total Estimated Units:* 90,000

- *Units Produced Year 1: 30,000*
- **Solution:**
 - Depreciation per Unit = $(50,000 - 5,000) \div 90,000 = \text{\$0.50 per unit}$
 - Year 1 Depreciation = $30,000 \times \$0.50 = \text{\$15,000}$

Strengths:

- Accurate calculation and simple example.
- Easy for beginners to understand.
- Correct application of accelerated depreciation, shows how book value decreases over time.

Limitations:

- GPT does not challenge students to think beyond the formula or apply it to real business scenarios.
- Examples are too mechanical and focused on the math, no discussion of why each method might be chosen strategically by a firm.

Experiment 3: GAI as a Real-Time Tutor

Prompt:

"I am confused about why the Double-Declining Balance method results in higher depreciation expense in early years. Can you explain why this happens?"

ChatGPT Output with Analysis:

- *Response:*
 "The Double-Declining Balance method applies a higher depreciation rate to the book value of the asset, which is largest in the early years. This means a bigger expense is recorded when the asset is new and has the most value. Think of it like driving a new car—the value drops quickly in the first few years because it's most useful then. Over time, as the asset's book value decreases, the depreciation expense also decreases."

Strengths:

- Accurate and intuitive explanation with a helpful analogy.
- Sufficient for addressing basic conceptual confusion.

Limitations:

- Did not connect the explanation to real-world accounting practices like financial reporting incentives or tax considerations without follow-up prompts.
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My overall reflections:

Through this experience with the experiments, I think I've gained a lot of faith in GPT 4.1 and other LLMs as a method for bolstering and adding to original knowledge. However, I can see why there are still huge limitations and drawbacks to using AI. Because it does not have the same explanatory capabilities where it connects with the student as a lecturer would, sometimes it breezes through concepts mechanically and focuses solely on the math, ignoring the real life context. While my lecturer and professors often spoke about the situations in which a company would pick one accounting method over another, here, the LLM focuses solely on getting the numbers and debit/credit entries right, which also has some merit.

At the end of the day, I can see LLMs being used more as a tutor alongside normal teaching methods, until they develop the ability to be better at providing holistic teaching and education. Right now, I would use LLM in my next accounting class solely to clarify any questions I have about a specific topic or question, but not to start from scratch and learn new topics. As such, this is definitely a use case of LLM in education that I want to keep an eye on, and I'm sure there will be numerous developments to come.