Center for Inclusive Teaching and Learning
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Bloom's Taxonomy "Analyze" Level and Generative AI

The proliferation of Generative Artificial Intelligence (GAI) tools is reshaping how the world approaches nearly every task, with changes likely to accelerate as these tools become more diverse and powerful. Rightfully, academics are questioning how to most productively deal with the changing technological landscape in higher education. Beyond worries about academic integrity and whether the work students submit is their own, there are legitimate questions about what learning is still foundational to the tasks required of humans in the workplace, and what would be better outsourced and automated. The following breakdown of GAI and Human Skills associated with Bloom's "Analyze" level of learning, and possible means of both assessing student learning and incorporating GAI into assignments may provide insight into how to your course should change in the GAI era. Please remember that Microsoft Copilot in the Edge Browser is the only approved GAI tool on our campus.

Analyze

In Bloom's taxonomy, analysis involves understanding the structure of knowledge. It requires breaking complex material into components to reveal patterns and structures. Analysis involves critical thinking to examine what is known from different perspectives, distinguish between facts and opinions, and reveal relationships.

GAI tools are good at analysis, since they can examine extraordinarily large data sets at speed and integrate or compare different data sets. They are able to automate this to identify patterns and trends rapidly, and to answer specific questions about a body of data.

Humans can bring unique emotional and moral dimensions to analysis. They can integrate internalized values from affective domain of Bloom's Taxonomy when examining the structure of knowledge. They are better able to combine nuances in their "real" understanding able than GAI, which lacks real understanding. This allows people to identify relevant questions to ask about data.

Action Words	**Assessment Techniques and GAI Cheat Potential :1 (hard) -5 (easy)**	**GAI-Integrated Assignments**
Analyze, Break down, Compare, Characterize, Classify, Contrast, Correlate, Debate, Deduce, Diagram, Differentiate, Discriminate, Distinguish, Examine, Illustrate, Infer, Outline, Relate, Research, etc.	• **Case studies**: Present students with a complex real-world scenario and ask them to analyze it, identify the problems, and propose solutions. This method requires application of analytic skills in a practical context. GAI- Cheating Potential, 2 GAI lacks the ability to understand nuance in real-world scenarios. It may offer some information and suggestions. • **Group discussions**: Have students participate in group discussions on a particular topic. Their ability to analyze the topic and contribute meaningful insights can be assessed directly or in reflections written immediately after the discussion. GAI-Cheating Potential, 1. GAI can't participate in discussions. • **Essays**: Assign essay topics that require deep analysis of a concept or issue. The students' understanding will be reflected in their ability to dissect the topic and present a well-argued essay. GAI Cheating Potential, if take-home, 4. AI can generate a well-structured essay, but it will likely lack personal insight and original thought. If in-Class, 1. Students can't access AI while writing in a blue book. • **Presentations**: Students are asked to prepare or deliver a presentation on a specific topic. GAI-Cheating Potential, 3. GAI may help students prepare the presentation and conduct the analysis, but it cannot "give" the presentation. • **Problem-solving tasks**: Give students complex problems that require them to analyze various factors and find a solution. This could be mathematical, logical, or a strategic game. GAI-Cheating Potential, if take home 5. GAI does well in analysis of defined problems without contextual nuance. If in-class, 1, assuming that GAI is not accessed during the analysis.	• **GAI-Powered Data Analysis**. Have students use AI to gather and analyze data on a specific topic, keeping track of their queries and prompts. They can then report on the data analysis, AI's role in gathering and processing it, and insights they were able to gain from it. You may wish to substitute known data sets, compare different data sets, or investigate the biases and shortcomings of the GAI analysis. • **Compare output from GAI analysis and personal analysis**. In this type of assignment, begin by having students analyze something appropriate for your course. Then, allow them to conduct a GAI-assisted analysis. They should compare the output to their analysis, and discuss what insights the comparison provides. • **GAI- decision making.** Assign a project in which students make a decision based on information about a topic generated by GAI. They can analyze how the AI helped in the decision-making process and what its limitations were, including its biases and inaccuracies.

References and Reading

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