For Everyone

Producing Complex Thought: Education and AI

Higher education is about learning how to produce complex thought. Now that AI produces a facsimile of this, why do we need education? What does it mean for a student to produce their own work?

To have ownership of a creative work, the author must make choices. Different tasks have different degrees of freedom, requiring judgment to be applied at different scales, and from different sets of possibilities. In certain technical situations there may be only a small number of legitimate choices that are acceptable, and yet finding them may be difficult. In more open ended or artistic scenarios, the space of choices may be vast.

With the advent of AI, many conventional assignments no longer require any choice or artistry from the AI-equipped student. Learning a basic technique, for example, and applying that technique in a variety of cases is standard methodology in many disciplines. But these kinds of problems can now be fully automated, and it means less to be able to solve them than it did in the recent past. Traditionally, at the end of a long apprenticeship in "technique", a student is given an open field to compose and combine techniques in novel ways. Now, post AI, the student arrives on the scene with this capability, armed with what amounts to an unlimited staff of agents capable of applying standard techniques.

But in the educational context in which we value human production of complex thought, the techniques are more than the sum of their parts. To prove a novel mathematical fact or to make a complex argument, each individual step is trivial. But to be able to see the path, to see the sequence of basic techniques that need to be applied, requires a high degree of skill. The degrees of freedom possible in the application of the basic technique is constrained, but the combinatorial possibilities presented by recruiting the techniques in sequence is virtually infinite.

In education we still need to put students through sets of increasingly challenging problems, to train them in the art of intelligently assembling basic parts into a structure that transcends them. We need to present students with goals for which it is not obvious how the goal may be reached.

Protect Data Privacy

Most AI programs are hosted by commercial entities and thus any information entered can be used by those entities. All unsecured AI systems should be treated like public platforms: no information should be shared that one would not share publicly. No one should enter protected information into an AI platform, such as student information regulated by FERPA, human subject research information, health information, HR records, etc. People should also avoid

prompts/responses regarding confidential work-related information, unpublished work, and individual ideas you would not want others to have access to.

AI and Prompt Literacy

An AI-literate student at John Jay should be able to assess critically the ethical implications of AI, creatively apply AI tools in their field of study, and demonstrate a commitment to academic integrity by using these technologies responsibly.

Examples of adhering to academic integrity in the AI era include properly citing sources generated by AI, using AI as a tool for learning rather than a shortcut for academic work, and engaging in original thought and critical analysis. Conversely, violations of academic integrity involve misrepresenting AI-generated content as one's own original work or bypassing the learning process through undue reliance on AI.

Part of responsible, literate use of AI is understanding the differences between the multiple AI platforms that exist (e.g., Perplexity.ai, Microsoft Co-Pilot, Chat GPT 3.5 and 4, Gemini, Claude.ai, Pi.ai, and many others that are use-specific) and their strengths and weaknesses. It is valuable to ask the AI what its purpose is and how best to use it.

The University of Michigan has [useful material on prompt literacy](#). When prompting AI consider using the RACE format - RACE stands for Role, Action, Context, and Execute. Define the role you want the AI to assume (Role), specify the task at hand (Action), provide additional context for depth and relevance (Context), and give clear execution instructions for what needs to be accomplished (Execute).

The best users of AI will be those that are already literate, critical thinkers. There are no short-cuts to the critical literacy a college degree cultivates.

Recognize AI as a Tutor and Learning Tool for Students

"AI is incredibly customizable. I can personalize ChatGPT or use an already personalized AI system to be consistent with my personal needs as a student. AI-powered tools are revolutionizing the process of my studying both ASL and Urdu literature, offering interactive and immersive experiences that far surpass traditional methods." – Iqra Waheed, first-year student

Generative AI tools can summarize readings, offer feedback on work for improvement, provide editing suggestions, teach a student the steps to solving complex problems, generate annotated bibliographies, determine if evidence is relevant to assertions, and refine theses.

AI tutoring tools designed for learning adapt to the student's progress, providing guidance that is tailored to their specific skill level and learning curve, especially in skill-based education. For homework assistance and tutoring, AI serves as an invaluable resource, offering instant help and problem-solving support. Lastly, the role of AI in feedback and assessment cannot be overstated. It offers real-time, objective feedback on student performance and progress,

enabling an effective and informed improvement process. This continuous feedback mechanism helps students identify areas of strength and weakness, allowing for a more focused and strategic approach to learning.