

Gen AI and this Class

(Adapted from the policy developed by Dr. M. Mayhall at Kean University)

Introduction

You may or may not know that right now people who work in higher ed are freaking out about Gen AI - how it's changing our jobs as professors, how students learn, what to do about students 'cheating' with AI, what it might do to things in the near future like your ability to get a job after graduation, whether we can continue teaching online classes, and even whether reading will continue to be an essential skill (and that's just in the area of education!). While this policy document is focused primarily on education, scientists – including those working on AI – have raised concerns about issues such as: *In-built bias, Misinformation, Surveillance, Copyright, Environmental impact and contributions to Climate Change* etc. You can read more about some of these issues in the references provided below.

I share some of these concerns but I would like to acknowledge that many of you may have used AI tools for a while and even found it helpful. I also realize that some of you may not have heard much about some of these issues. This class policy does not dismiss your own experiences or feelings about the matter but I have spent time studying the impacts of this new technology and am not exaggerating the seriousness of what we are all facing. Since AI has infiltrated all aspects of our lives, it is important and the responsible thing to do to spend time considering its impact. . *Knowing the repercussions of our actions beforehand allows us to make informed choices and also makes us aware of our responsibility and complicity.*

AI in Education

One thing we need to acknowledge at the outset is that whether or not your professor wants to incorporate Gen AI into your class will depend on the discipline they're a specialist in -- is it a class preparing you for a specific job/career in which AI skills are in demand? What are the learning goals for the class, and does AI help, or hinder, students achieving those? What kind of preparation/background do the students in the class have in the discipline, but also in AI? What kind of AI expertise do the professors themselves have? It can't just be a simple statement like "*we're using it*", or "*I'm banning it*" -- professors have to think through a lot of issues before they make an informed decision. All of this is happening in an environment where the apps and what they can do are changing too fast to keep up with.

AI and the Environment

One of the most important issues about the rapid development of AI technology is the rate at which it consumes energy and contributes to climate change. Data centers which power AI systems require a large amount of material resources, energy and water. Some specific concerns include:

- Environmental and social impact of mining rare earth metals used for these data centers many of which come from developing countries.
- CO₂ emissions from the increasing construction and operation of these data centers.
- Water usage and contamination and impact to the ecosystems around the data centers.
- Electronics-waste, including those from Data Centers are not just dumped in landfills in the US. A lot if it is shipped to places like Nigeria, Philippines, Ghana, China and the Balkans who do not have effective waste management programs leading to considerable destruction of their ecosystems.

While technology companies are indeed working on making these systems energy efficient, history has taught us that efficiency leads to increased use which, after a point, surpasses previous limits. Economists refer to this as *Jevon's paradox*. Therefore, environmental concerns cannot be addressed by efficient design alone; reducing our consumption is key.

AI and Writing (and beyond)

There's a lot of talk in our society about how if AI can do it, then it's not worth doing by humans. Take for instance, writing. Thinking that what Gen AI produces is writing is a problem – Large Language Models like Claude, Chat GPT, and Gemini don't 'write' so much as they **extrude text** based on prediction models. But there's also the issue of *why* we ask students to write in classes. Even if it's something an AI model can produce well, the human act of writing is, according to a lot of experts in the field is important **as a process** for several reasons: 1) through the process of writing you learn what you're thinking, 2) getting your thoughts down on paper helps you organize your thoughts, 3) learning how to write helps you communicate better, and 4) writing can make you a better reader, and vice versa. The same can be said of doing math.

Now you might think, oh, well, I won't need to read and write, the model will do it all for me, but let me tell you that *that* world is not here, and it might never be. I hope it will not. A lot of AI experts are saying that the old school skills of reading, writing, critical thinking, and communication are the things that will make students stand out in the job force. *You can be taught how to use AI **IF** you have those skills, and you'll need them to use AI well.*

Cognitive Offloading

How about the idea that you can just look things up, or ask the model to give you the answers to something? Have you tried that with something you actually know something about? How did that go? Maybe not as well as you had hoped, and there's reasons for that. For one, the text it comes up with is really generic and sometimes subject to hallucinations (i.e. just plain wrong and/or made-up). But the specific thing I want to call out here is what psychologists call *cognitive offloading*, which is the idea that you use external tools to do something you used to do with your brain – like the fact that most people don't know anyone's phone numbers except for their own, or that without Google Maps people don't know how to navigate beyond their usual routes, and have completely lost the ability to use a map. Do not trust people who say Gen AI is "just like a calculator". It is NOT!.

What is most troublesome about cognitive offloading is that the pro-AI people say that using AI will free us up to do the REAL human things and to be creative and to emphasize human relationships! Never mind that most people are using these apps by themselves, so it really does not foster communal activity. My question is, **how can you be creative if you don't know anything?** Or how to learn it?

Attention Loss

Many are also worried about the issues of attention and focus, and I know you've probably thought about it, too. The algorithms running behind the scenes on our phones and computers (and AI) are designed specifically to grab our constant attention. Social media demands have us hooked to short-form digital content which has resulted in loss of focus, ability to read long text or write long essays without being constantly distracted. Learning anything requires patience and perseverance which are being eroded. While AI has interesting features and there are fun things one could do with it, including in learning, you

must be mindful of the fact that the designers of AI systems are not always doing it for altruistic motives; their objective to maximize profits sometimes comes at the cost of your learning and personal growth. This is something you need to think about – what are the motives and backgrounds of those who are trying to sell you these products?

Invisible Workers

A popular American quote often attributed to Oliver Wendell Holmes (and perhaps derived from John Stuart Mill) goes “*The right to swing my fist ends where the other man’s nose begins*”. While this saying is meant to protect our individual freedoms, a literal, social Darwinist interpretation suggests that the ‘worthier’ and ‘deserving’ person can manipulate the environment around them provided they avoid noticeable physical harm to another. The US constitution is meant to protect people from tangible and intangible harms and our sense of ethics and morality are meant to safeguard from our worst instincts, those in other nations who are not bound by our constitution. You may wonder what this has to do with AI use in your education. Well, this complex and impressive technology did not just appear in a day. It is the result of several years of (and ongoing) effort by people around the world – often those in poorer nations (called *Invisible Workers*) who are subject to extremely low wages and quite horrendous working conditions (see Ref 6). Believe me when I say that you would not want to subject yourself or anyone you know to such work environments. The employers (AI companies or their satellites) are not beholden to the workers who have no job security. It is therefore important to consider what price one is willing to pay for mere convenience and speed! What can we do to as consumers to demand humanitarian practices from the developers of these technologies?

AI Policy in this Class

So, all of this is a very long introduction to my own approach to Gen AI in this class, which is based on several years of teaching and thinking/writing about learning. This is a foundational class, which is meant to do something very specific. This course is the backbone of your college education and means much more than simply being another course for your degree. It is in classes like these that you learn how to think. In this course we’ll be working on your **metacognitive** skills as techniques you can use for this class (and your **life**).

- Therefore, neither you nor I will be using Gen AI in this class, unless it is explicitly stated, because I want you to fill your brain with interesting and provocative information about this subject.
- I am not banning the use of AI but we should have an open conversation in class about the best ways to use it in this class before it is utilized.
- I will never use Gen AI for grading or for any part of designing and implementing my teaching practice.
- Unauthorized use of AI to produce your responses will constitute cheating and subject to appropriate penalties.

I like to spend my time thinking about how to use mathematics/science creatively to address all kinds of problems. Yes, math and science can be extremely creative if you give them the chance and try to engage with the content. While you have seen math throughout school, you are often simply asked to compute

and not think deeply about it. In this course, we will try to *make sense* of math in creative ways and I can assure you that *understanding math is about the process and not the final product or result*.

- In this math course, this means reading, attending class, asking questions, trying things for yourself, experimenting, giving time to the subject and not giving up. At the end of the day, I (and all your teachers) am interested in YOUR CREATIVITY and not how creative AI can be.

I don't always have to look stuff up in math because I know some of it, and I know how to learn the math that do not know yet. I have that base knowledge, without which I wouldn't know what to ask or look up. Your teachers and even employers want you to get to a similar place in your learning.

Embrace your humanity and believe in your own capabilities and potential!

Some things to think about

Here are some things that are being talked about a lot in the Gen AI space these days, seven rules that the writer Neil Postman came up with around technology way back in the 1990s that are *still* relevant. Postman asks us to reflect on these important questions:

1. What is the problem to which technology (in this case, AI) claims to be a solution?
2. Whose problem is it?
3. What new problems will be created because of solving an old one?
4. Which people and institutions will be most harmed?
5. What changes in language are being promoted?
6. What shifts in economic and political power are likely to result?
7. What alternative media might be made from a technology?

References

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