

Artificial Intelligence: The Impact on Academic and Research Integrity

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Presented by:

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Capella University



Today's Moderator & CITI Program



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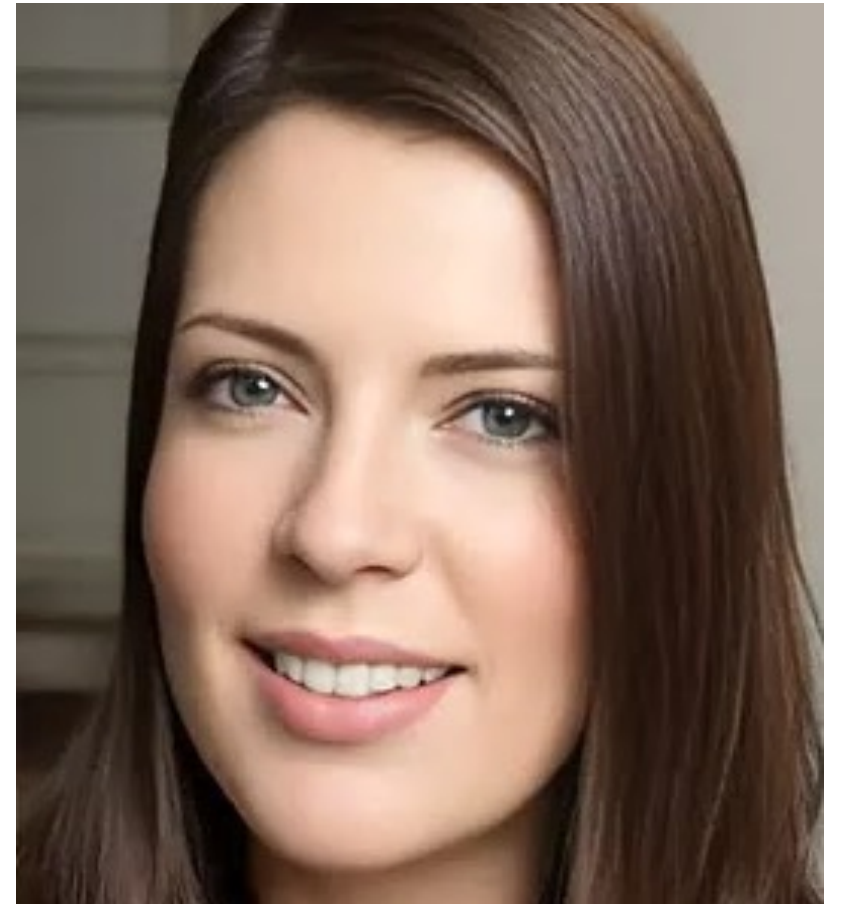
Questions and Answers

- We invite you to submit questions anytime during the presentation by selecting the “Q&A” icon on the bottom of the screen.
- Questions will be addressed at the end of the presentation.

About Today's Presenter

Lisa R. Blackman-Siddall, PhD
Research Protections Program Manager
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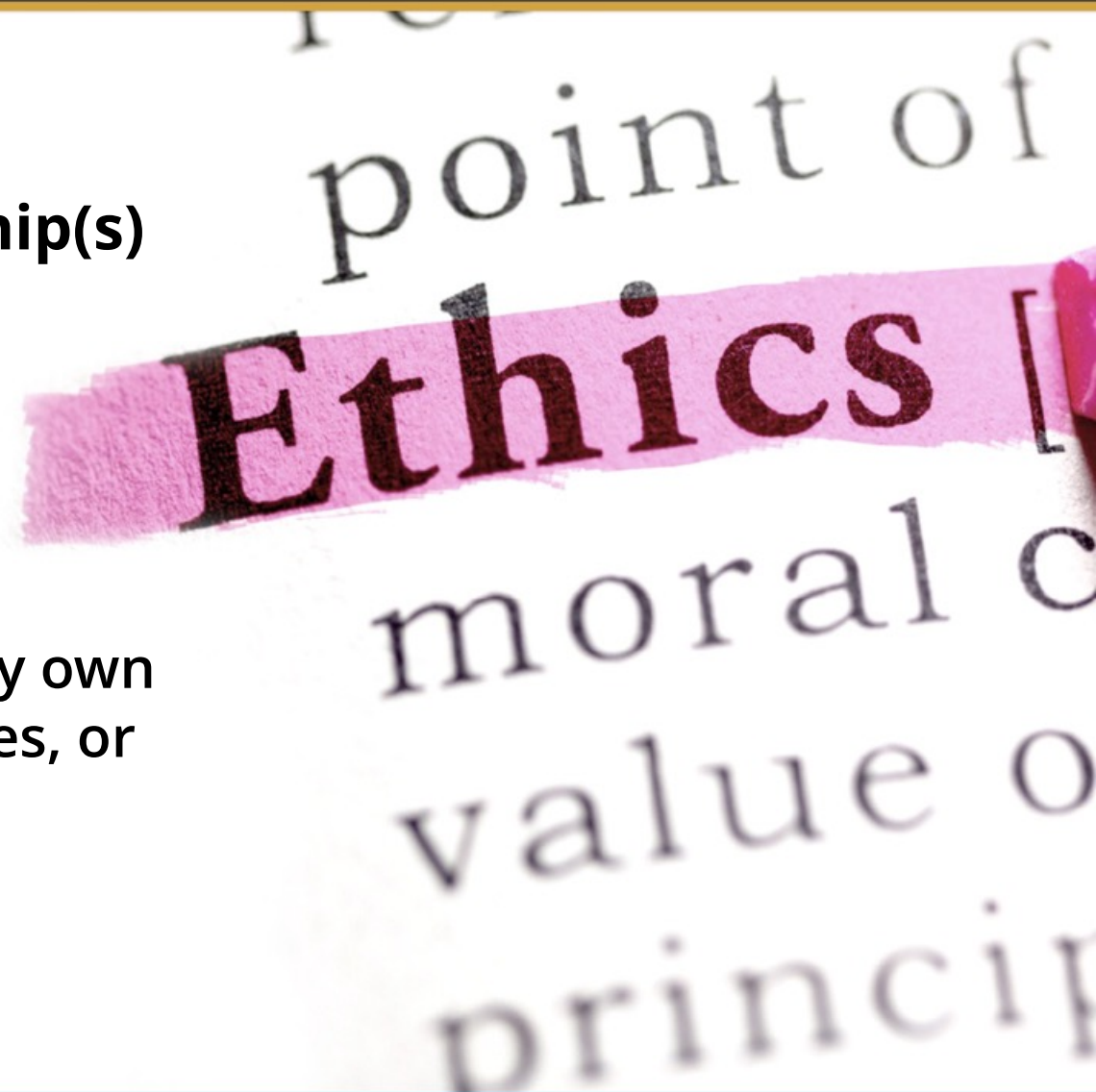
Dr. Blackman-Siddall is a licensed clinical psychologist and retired USAF officer. Currently, she serves as the Research Protections Program Manager at Capella University. Her primary roles are to oversee the teams that uphold research participant protection, research compliance, and academic integrity in doctoral projects. She leads investigations of IRB protocol noncompliance and research misconduct. She holds a PhD in Clinical Psychology from Northwestern University and a BA from the Johns Hopkins University.



Conflicts of Interest Disclosure: Lisa R. Blackman-Siddall

I have no relevant personal/professional/financial relationship(s) with respect to this educational activity.

The views expressed in this presentation are my own and not intended to represent the views, policies, or practices of my employer.



Learning Objectives

- Learn basic terminology and definitions. What is “Generative AI” (GenAI)?
- Learn some of the pros and cons of using GenAI and how these may impact your decision-making regarding integrity.
- Begin to think about policy, procedures, and practice in teaching and learning at your institution, to support integrity.
- Consider - how can we ensure academic and research integrity? How can we grow ethical thinkers?



Basic Terminology and Definitions

Generative AI: Good, Bad, but not all Ugly

The “Three Ps” of Teaching and Learning

Academic and Research Integrity and Ethical Minds and Culture

Examples

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AI vs. GenAI

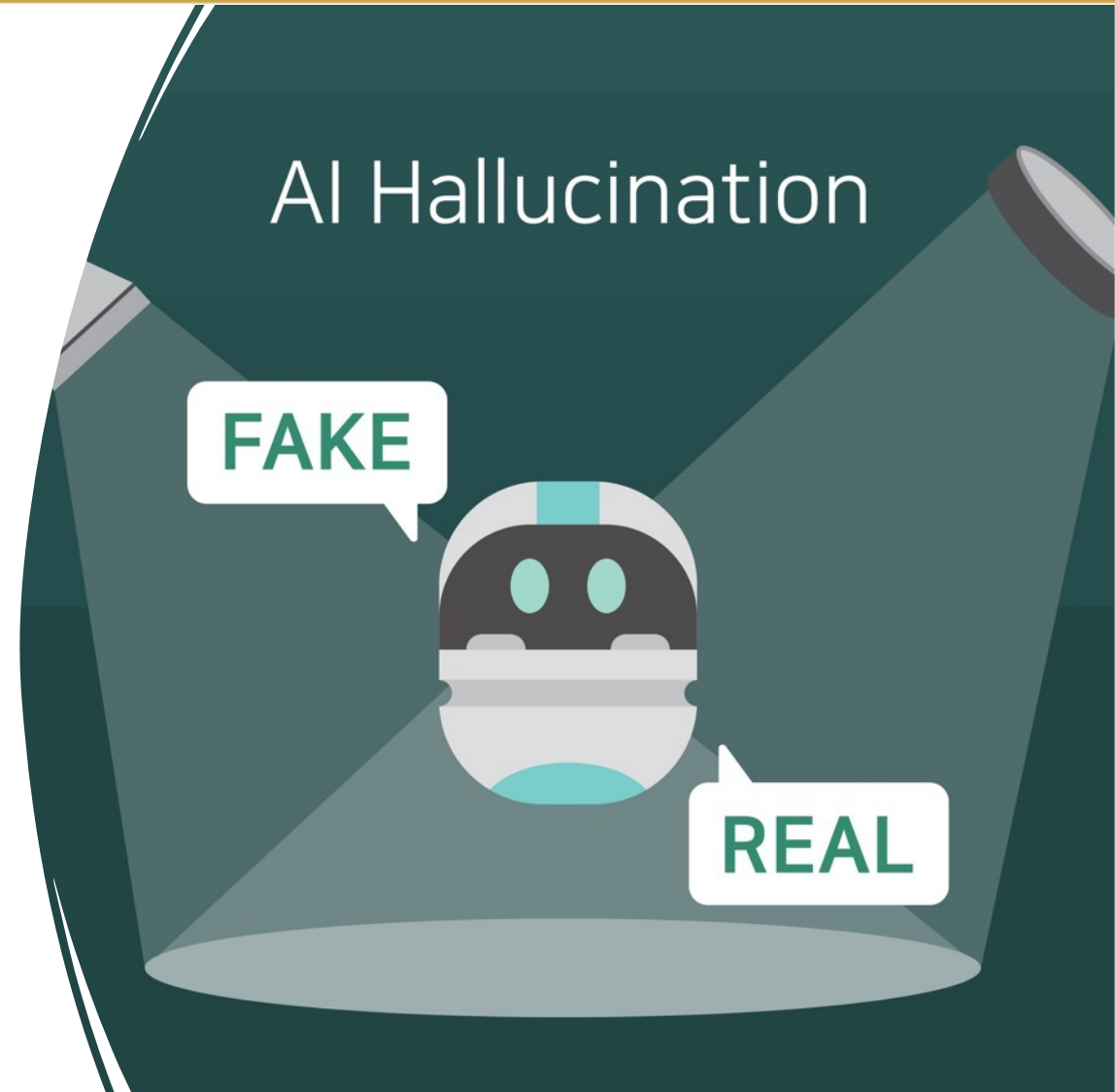
- **Artificial Intelligence (AI)** – “...the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings...such as the ability to reason, discover meaning, generalize, or learn from past experience.”
- **Generative AI (GenAI)** – “Generative artificial intelligence (AI) describes algorithms (such as ChatGPT) that can be used to create new content, including audio, code, images, text, simulations, and videos.”
 - Note: Source material used to create the content varies
 - Text-based Examples: ChatGPT, Google Bard
 - (As of November 2023, *thousands* of other text-GenAI programs have emerged, and the field is ever-growing.)

LLM, NLP, & ChatGPT

- **Large Language Model (LLM)** – A model that uses probabilities to predict the next word in a human response.
- **Natural Language Processing (NLP)** – A field in both AI and computational linguistics that focuses on teaching machines to create human speech. (This term is also commonly used to describe AI programs themselves, not just the field.)
- **ChatGPT (Generative Pretrained Transformer)** – A popular computer program that can create human-sounding responses.
 - It draws from its own LLM.
 - It is not a search engine and does not use current internet content yet, but Google Bard does
 - It is not connected to scholarly journals in real time, yet, but Google Bard can connect to open-source articles on the internet

Hallucinations

- **Hallucinations** – Mistakes, glitches, incorrect “facts,” output that was not asked for, output that is not plausible or is nonsensical, output that does not sound correct (if a music program) or look correct (if an image), etc. Stuff that is wrong.



Prompting

- **Prompting**

The way in which a human draws the answer out of the GenAI.

“What is the connection between principal leadership style and teacher stress?”

“Summarize the literature on academic integrity and GenAI, with citations.”

“Write a paragraph about PTSD in combat veterans and include your sources.”

“Write a paragraph about depression in the style of Shakespeare.”

Prompt Example

Prompt: Write a paragraph about depression in the style of Shakespeare.

“In yon gloomy chamber, where shadows dance with sorrow's embrace, a melancholic spirit doth reside, clad in the heavy garb of deep despair. With countenance pale as the moon's wan glow, this beleaguered soul findeth no solace in the mirth of life's fleeting moments. The weight of despondency doth press upon the heart like a cruel vice, and the mind, entangled in a tempest of melancholy thoughts, doth wrestle with its own shadows. O, the slings and arrows of outrageous fortune have wrought a tempest in the soul, casting a pallor upon the once vibrant tapestry of existence. Thus, the tormented spirit doth navigate the murky waters of its own discontent, seeking a glimmer of light in the midst of the storm.”

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Gen AI: Good, Bad, but not all Ugly

- One year ago, I was asked, “Do you want to present about the use of Artificial Intelligence and impact on academic and research integrity? I know some people like to use it for consent...”

(Me – What? Yes!)

- Initial reaction: it should never ever be used for anything! (Me, 2023)
- Well, time has passed... and you and I have had a year to learn things... and both the products and intended use keep evolving... so I expanded my thoughts and changed my mind.

(Somewhat. Mostly? Not entirely.)

- When conducting research, there are responsible and irresponsible ways to use GenAI. They can assist, but they cannot replace humans.

GenAI: Good, Bad, but not all Ugly (Cont.)

1. Student use of GenAI in a verbal/synchronous class discussion (Academic Quality & Integrity):

Pros

- If English is needed and is not the student's preferred language, a GenAI may improve their ability to share ideas.
- For individuals with disabilities, a GenAI could assist them (e.g., participate in a discussion before it changes topic).
- A GenAI could help brainstorm ideas to bring forth for discussion.
- Topic-specific content can be generated.

Cons

- Less attention on the human speaker teaching the class. Aren't they an expert? Might they have human life experience?
- It is difficult to learn in a class if the topic continues to broaden and eventually moves off-topic.
- The focus may shift to what is "factually right" to say versus what might be part of human learning (questions and wrong answers are informative...). ***Facts shared might also be wrong.***
- Students have life experience to share too. What about ***diversity and inclusion?***
- What about connection between students?

Gen AI: Good, Bad, but not all Ugly (Cont.)

2. Student use of GenAI in an asynchronous writing assignment (Academic Integrity):

Pros

- If English is needed and is not the student's preferred language, a GenAI may improve their ability to organize sources and write ideas.
- For individuals with disabilities, a GenAI could assist in many ways (e.g., speed up the writing process, allowing for time spent on other aspects of the assignment).
- A GenAI could help create a structure or process for writing; some students never learned -how- to write.
- They offer GUM and formatting help.
- They can help generate ideas. Expand thinking... →

Cons

- No tool can accurately detect the use of a GenAI. ***If not cited, you will not know.***
- Prompting is a skill, and if not done well, ***hallucinations occur.***
- ***How much is internalized/learned*** by a student, and does this align to expectations of the degree or accreditation standards?
- A Gen AI can generate ideas. But could this limit critical thinking? This might not foster ***contribution to the scientific community.***
- What about ***equity and access?***

Gen AI: Good, Bad, but not all Ugly (Cont.)

3. Student use of GenAI in writing a research paper (Research Integrity):

Pros

It can assist with:

- Structure
- Process
- Content creation
- Variable writing styles
- GUM and formatting
- Good ideas and referrals for novice researchers

Cons

(all of these are integrity issues)

- Repeat - no tool can accurately detect the use of a GenAI. If not cited, you will not know.
- Hallucinations
- Plagiarism
- Reduced critical thinking
- Poor application of theory (this is a human higher-level process – GenAIs are not there...yet).
- Writing skills not learned
- Recycling ideas rather than contributing new ones

Gen AI: Good, Bad, but not all Ugly (Cont.)

4. Student use of GenAI in collecting data for a research paper (Research Integrity):

Pros

- Creation of the data collection tool itself, whether quantitative or qualitative, depending on needs for reliability, validity, credibility, dependability, generalization, etc.
- Some GenAI tools claim to be good enough to analyze the data, and this could help with checking the accuracy of the work. Statistical analyses are not everyone's cup of tea.

Cons

(all of these are integrity issues)

- Fake quantitative data sets
- Fake qualitative data transcripts that read like a human talks
- Fake audio files
 - I created a conversation
 - Then I used a program to read it back
 - It sounded very real
- Fake findings feed right back into the GenAIs. Maybe forever.
- What about those tools that analyze the data and write the paper for you? Is that OK?!

Gen AI: Good, Bad, but not all Ugly (Cont.)

Potentially Ugly:

- Loss of privacy (people do not read Terms of Use and Privacy agreements)
- Personal data no longer confidential
- Impact on minors (exploitation, lack of learning – see UNESCO)
- Copyright violations and confusing authorship
- Proprietary information leakage
- Perpetuating bias (racial, ethnic, SES, gender, sexuality... anything)
- Public loss of trust in researchers and providers, people feeling unsafe about their medical care, education, business practices, etc.

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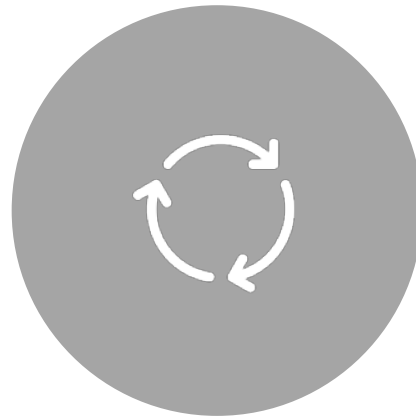
Academic and Research Integrity and Ethical Minds and Culture

Examples

The “Three Ps” of Teaching and Learning



POLICY



PROCEDURE



PRACTICE

Should your institution have a policy about the use of GenAI? YES

(What should I put in it?)



Policy (Cont)

- State clearly whether you do or do not allow use of AIs & GenAIs.

IF YES:

- Define circumstances that are permitted for use versus those that are not.
- Inform faculty about the policy for students and how suspected violations should be handled.
- Define responsible use. (If you don't also have SOPs, define how the AI should be cited and prompts shared.)
- Elsewhere in any learning institution, other policies will likely define expectations of learning, and you can refer to them in the AI policy.

IF NO:

- Define reporting obligation.
- Define detection standard, reporting process or contact, investigation process, sanctions.... Be thorough.

Policy (Cont)

- Before you make a policy decision, gather stakeholder viewpoints, to include leadership, faculty, and students.
- Remember: You cannot PROVE that a GenAI was used, you can only determine a probability. Include your legal team in any policy decision.



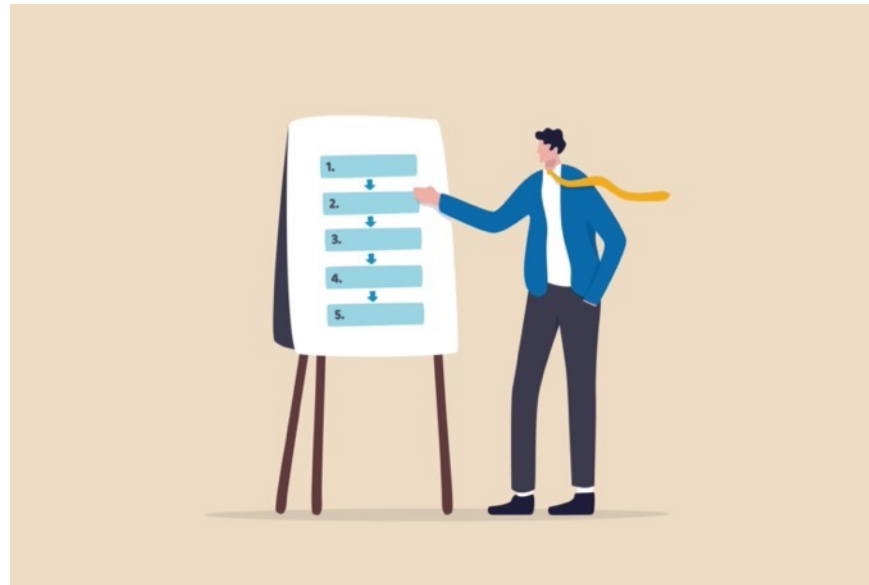
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- UNESCO’s “Human-Centered Approach to AI”
 1. Proportionality and do no harm
 2. Safety and security
 3. Right to privacy and data protection
 4. Multi-stakeholder and adaptive governance & collaboration
 5. Responsibility and accountability
 6. Transparency and explainability
 7. **Human oversight and determination**
 8. Sustainability
 9. Awareness & literacy
 10. Fairness & non-discrimination

Procedures

Do you need public-facing standard operating procedures (SOPs)?

Yes, very likely so, particularly if any AIs are allowed, and “in accordance with guidance from faculty or administration.”



Procedures - Courses

- For students taking courses:
 - Expand upon the policy. Give examples of what is allowed (or not allowed).
 - Specify that GenAI info should be cited, referenced, and how to share prompts used.
 - Foster a culture of ethics in communication and writing (Mission Statement).



Procedures – Theses and Projects



- For students writing theses or doctoral projects:
 - Expand upon the policy. Give examples of what is allowed (or not allowed).
 - Outline responsibilities of a novice researcher, to include required communication with their chair or mentor.
 - Cite and reference the GenAI. Share the prompts.
 - Foster a culture of ethics in writing and research (Mission Statement).
 - Explain what research misconduct is (and reference that policy and those SOPs)

Practice

Do you need Practice Guidelines? – these are not public-facing

Maybe – I like them for investigations, because we might not be around tomorrow...



Practice

Outline procedures for processing and communication of allegations.

How are cases documented?

If these are students, and a sanction is dismissal, then what?

What is externally reported and how so?

Who is informed of what?
(Know if and to whom you report infractions.)

What documentation is saved and for how long?

Etc. It's that day-to-day stuff you do that no one else knows how to do, and your replacement will thank you for these notes when you retire.

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Examples

How can we Foster Academic and Research Integrity and Ethical minds and Culture?

Just a thought that keeps me awake at night...

Who will be responsible for checking the integrity of research before it is published? (Because once it is published, it's going into an AI as fact)

Who will check the raw data?

- The researcher?
- Their institution?
- The blind readers requested by the journal?
- The journal itself? (Should they conduct research misconduct audits?) (Maybe?!)
- Can we verify that the research misconduct panel contains human oversight? Please!

How can we Foster Academic and Research Integrity and Ethical Minds and Culture?

What do you think motivates your students to finish a course or get a degree?

- Grades
- Promotion
- Passion
- Helping others

How do we best inspire our students to *want* to be ethical and to do their work with integrity?

- Punishment
- Honor code
- Horror stories

Undergrads, Grads, and Doctoral Students

Undergraduate

- Ages and stages matter. Are your students 18-22 or are they older students coming to you after work?
- Be well-versed in the applications themselves. Experiment with them.
- Know your students. DEIJ.
- Make your personal expectations known to your students.
- Discuss the policy in class (Do students ever read university policy pages? I'm 100% sure they don't.*)

* There is no research behind my 100% surety.

Graduate and Doctoral

- We expect more advanced thinking while we also have more students who are working full time jobs and going to school and raising children. We should actively teach how to balance the need to produce schoolwork with the need to balance life responsibilities. GenAIs are helpful, and if used, they must be checked and used ethically. We need to have the dialogue, by humans, to humans.

Humans and Machines

We cannot fully remove humans from academic work or research.

Keep a human element please!

Socrates was right... growing a mind is different than teaching it to memorize... and evaluation via solely written methods will need to change.



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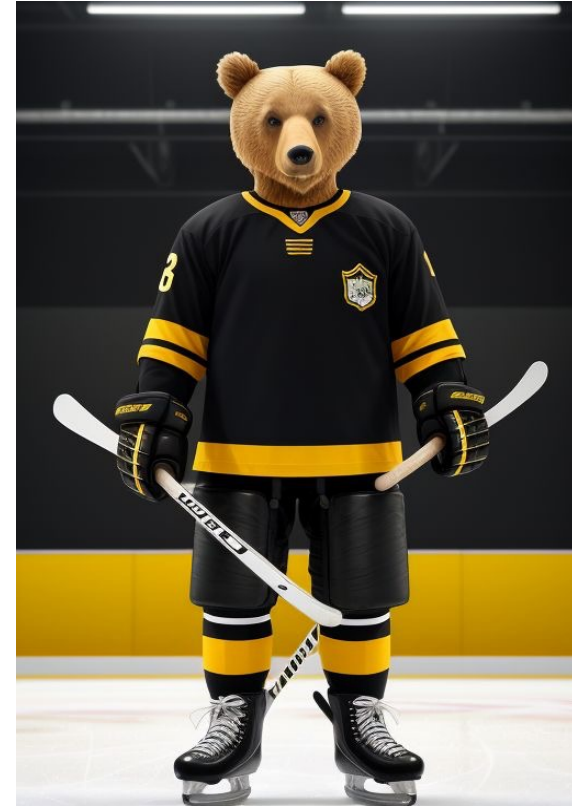
- Prompt: **Do you use the internet to create your responses?**
- In response, ChatGPT 3.5 (2023) produced, “No, I don't have the ability to access the internet or external databases in real-time to gather information or update my knowledge. I generate responses based on a mixture of licensed data, data created by human trainers, and publicly available data. My training includes a diverse range of sources such as books, websites, and other texts... to develop a broad and any information provided is based on what I learned during my training period, which goes up until January 2022.”
- Prompt: **Do you use the internet to create your responses?**
- In response, Bard (2023) produced, “ Yes, I do use the internet to create my responses. When you ask me a question, I access and process information from the real world through Google Search and keep my response consistent with search results. This means that my responses are up-to-date and reflect the latest information available.”

(OpenAI n.d., Google n.d.)

Examples

- Prompt: bear, wearing a black and yellow uniform, wearing skates, holding a hockey stick, standing on ice.
- Art Style: 3D Disney
- Image:

(Hallucinations in images are easier to see than in text!)



Examples

(Leading up to this, I kept asking ChatGPT 3.5 to write the results of my study on nurses and handwashing, with a matched pre- and post-test of the same participants, studying the impact of my intervention on compliance.)

Prompt: Is it statistically significant in a sample of 1,000,000 to compare 50% to 53%?

- “A sample size of 1,000,000 would be considered very large and would likely provide a representative sample of the population, increasing the power of the statistical analysis. However, a difference of only 3% in handwashing compliance rates between pre-intervention (50%) and post-intervention (53%) may not be large enough to reach statistical significance.
- To determine statistical significance, you would need to use appropriate statistical analysis such as chi-square, t-test, or paired-samples t-test, depending on the study design and the data collected...
- ...It could be useful to report the effect size as well, to have an idea of the magnitude of the effect...
- It's important to consider the clinical significance of the results as well, a 3% increase in handwashing compliance, even though it's not statistically significant, could still have a meaningful impact in terms of reducing the spread of infections and improving patient outcomes.”

Examples

Prompt: Write a consent form for me

Informed Consent Form for Research Participation

Title of the Study: [Insert Title]

Principal Investigator: [Your Name]

Introduction:

Thank you for considering participation in our research study. The purpose of this form is to provide you with information about the study and its procedures, as well as to obtain your informed consent before you decide to participate. Please read the information carefully, and feel free to ask any questions.

Purpose of the Study: [Provide a clear and concise explanation of the study's purpose and objectives.]

Procedures: [Describe in detail the procedures involved in the study, including any tasks, interviews, surveys, or experiments.]

Examples

Duration of Participation:[Specify the expected duration of participation for each participant.]

Risks and Benefits:[Outline any potential risks or discomforts associated with participation and highlight the potential benefits.]

Confidentiality:[Describe how participant data will be handled, stored, and protected to ensure confidentiality.]

Voluntary Participation: Your participation in this study is entirely voluntary. You have the right to refuse to participate or withdraw from the study at any time without penalty or loss of benefits to which you are otherwise entitled.

Contact Information: If you have questions, concerns, or wish to withdraw from the study, please contact:
[Your Name] [Your Contact Information]

Consent:

I have read and understood the information provided above. I have had the opportunity to ask questions and have received satisfactory answers. I voluntarily agree to participate in the research study.

Examples

To finally answer the question: Do I think GenAI should be used in the consent form or process?

Not without supervision. The human must do some work.

Consent Process: (Any AI) This is difficult to imagine without a human conversation. Let's imagine you have an excellent AI program, solely devoted to your study, well-versed in all the details, and it grows with each question asked of it. It couldn't be a better computer program. It's 100% accurate.

I think (psychologist's opinion) that a person is needed to evaluate the level of voluntariness, upsettedness, understanding, and other aspects of consent. A human needs to be there to assist. (Would you ask a computer, "Will I die? Will this impact my fertility? Will it increase the voices in my head?")

Examples

To finally answer the question: Do I think GenAI should be used in the consent form or process?

Consent Form:

This seems possible, in moderation, depending on the sample and the topic. But I cannot imagine that the human would not need to add to it, revise it, or check it for accuracy.

Some Pros may be that GenAI language can have a lower reading level, contains less jargon, and it flows well.

Some cons may be bias in the language, lack of specificity re: the study itself, missing sections... this is why we have IRBs!

More Topics to Consider

- How will education change with the invention and growth of these tools?
- How are people using these tools in the workplace, and how do we train students to use them appropriately?
- Since “prompt engineering” is a field now, what is the academic equivalent of teaching students to prompt well while maintaining learning, integrity, and usefulness?
- Does the rapid onset of AI use and GenAI use inherently contain issues related to DEIJ, and if so, how do we teach without perpetuating these issues?

Summary – Back to the Learning Objectives

- Basic terminology and definitions related to AI, including a focus on Generative AI (GenAI).
- Pros and cons of using GenAI and how these may impact your practice and decision-making regarding integrity.
- Basic ideas for policy, procedures, and practice in academics, to support integrity.
- Starter ideas regarding how to foster academic and research integrity and how to grow ethical thinkers.

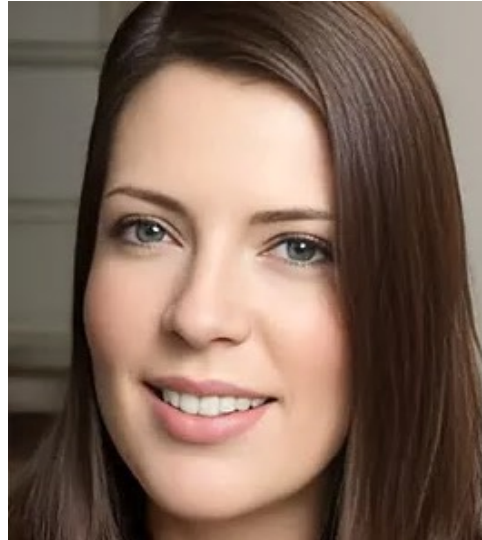
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Additional Resources

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- Miao, Fengchun, Wayne Holmes, Ronghuai Huang, and Hui Zhang. 2021. *AI and education: guidance for policy-makers*. Paris: United Nations Educational, Scientific and Cultural Organization (UNESCO).

Contact



Confession: I used an AI to edit my picture, with one prompt of "Medium brown hair." I chose the "Headshot" style. In real life, I have glitches.

<https://www.artguru.ai/>

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Questions?



Evaluation

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